

2nd Congress on Traditional Sciences and Technologies of India

27th - 31st December 1995

Anna University, Madras



**KEYNOTE PAPERS
AND
EXTENDED ABSTRACTS**

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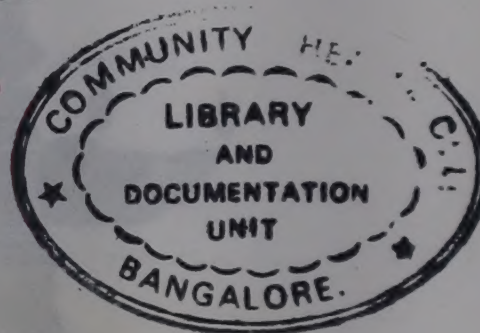
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Preface

This volume is a compilation of the abstracts of the technical papers, keynote talks, and workshops, presented at the 2nd Congress on the Traditional Sciences and Technologies of India being held at Anna University, Madras from 27th to 31st Dec. 1995. There are about 311 technical papers, 7 keynote addresses and 6 workshops covering over 15 subjects and themes including Architecture, Metallurgy, Bamboo, Pottery, Textiles, Agriculture, Forestry, Water Management, Fisheries, Health, Food and Nutrition, Biodiversity, Navigation, Education, Local Markets, Policy Issues, Role of Communities and Role of Women.

We have put the keynote addresses as a separate chapter to distinguish it from other technical contributions. We have also made an effort to put together the last minute entries as a separate chapter under late arrivals. There are 29 papers with abstracts in Tamil which contribute a separate section in this compilation.

Eventhough an attempt has been made here to truly reflect the vastness and spread of the Congress, this compilation would still be an incomplete representation of all the materials that would be presented at the Congress. The abstracts of several papers and keynote addresses have not reached us at the time of going to the press, there is also no information here on the exhibition and demonstration component of the Congress.

This volume would not have been possible without the untiring efforts put in by a large number of individuals over a long period of time. We sincerely extend our thanks to all the co-ordinators of different subjects and themes: Sashikala Ananth (Architecture), Dharmalingam (Architecture and Metallurgy), Bhanu Prakash (Metallurgy), Kodumudi Shanmugam (Pottery), Aarthi A. Kawlra (Textiles), K. Vijayalakshmi (Agriculture and Livestock Management), V. Arivudai Nambi (Forestry), Ravi Chopra (Water Management), J.B. Rajan (Fisheries), G.G. Gangadharan (Health), Ramanna (Food & Nutrition), Ananthapadmanabhan (Education), Ashish Kothari (Biodiversity), B. Arunachalam (Navigation), Naresh Sharma (Local Markets), Navjyoti Singh (Policy Issues), S. Rajalakshmi (Role of Women) and G. Sivaramakrishnan (Role of Communities). We are grateful to all the authors and keynote speakers who have given their texts in time.

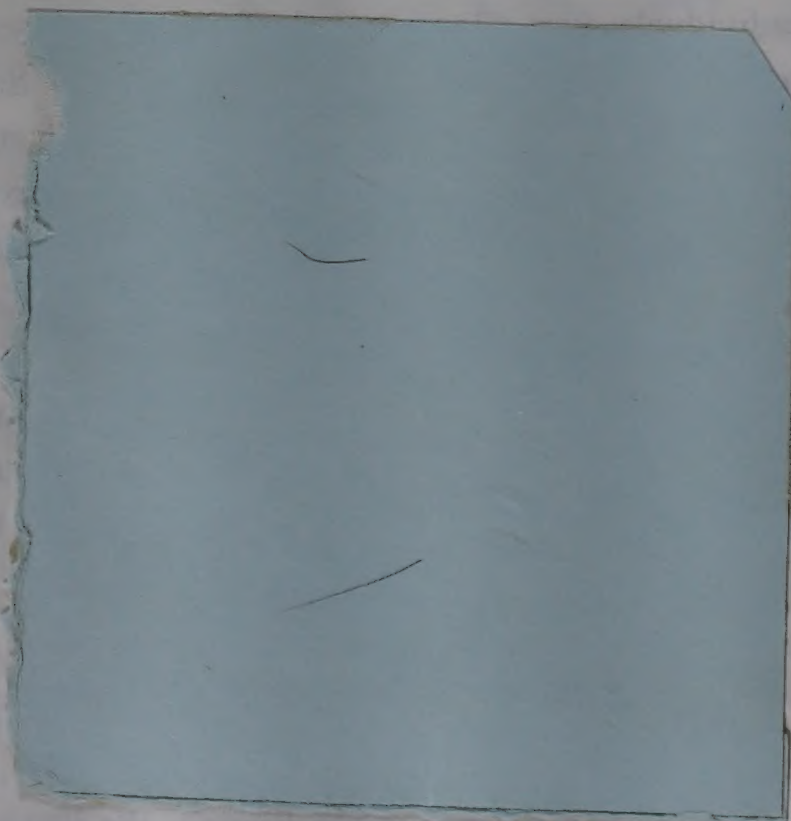
The production of this volume is itself the result of the dedication and hard work, mostly of the honorary type, of many young men and women, including D. Rupa Mala, Shipra Sengupta, S. Sathya, B. Shanmugavalli, K. Anandhi, N. Jeyanthi, D. Ragothaman, Ramesh, R. Venkateshwar, and H. Raman. We also acknowledge the cooperation of Nathan & Co., Madras who accepted to take up the responsibility of printing this volume.

Assembling all this material together has been the task of the Congress Secretariate at Anna University under the supervision of L. Kannan, Secretary, PPST Foundation, and entire Congress publications activity has been handled by J. Srividya.

In so far as the contributors to this volume come from a wide variety of backgrounds, training and outlook, it is understood that the irrespective authors themselves are responsible for the views expressed in this volume, and these need not necessarily be shared by the organisers of the Congress.

C.N. Krishnan
Anna University

Prof. Ashok Jhunjunwala
PPST Foundation



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Architecture

The Concept of 'Vastu Purusa' and its Mathematical Implications

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The Cochin College, Cochin - 2

Vastu means the place of residence and later it is extended from residential quarters to conveyances and furniture. *Vastu Sastra* is the science of habitation (vastu). There existed several known texts of *Vastu Sastra* in Sanskrit as well as scores of others in local dialects. In most of these texts, the concept of *Vastu Purusa* is stressed.

Vastu Purusa which is the energy contained in the earth is perceived as a male figure tightly coiled into the grid of 64 or 81 or 100-part modules. *Vastu Purusa* has a mythological origin as explained in Chapter 226 of *Matsya purana*.

In traditional Architecture *Vastu Purusa* who is said to be pressed prone to the earth has his several limbs in particular

portions of the site. *Vastu Purusa* determines the position of the house and his different limbs represent the positions of different parts of the house. Here we can see the application of co-ordinate Geometry. The *Brahma Sutra* and the *Yama Sutra* represent the X-axis and the Y-axis respectively and with respect to these axes the 53 positions on and around the *Vastu Purusa* are determined.

Rene Descartes (1596-1665) in 17th century defined a new branch of Mathematics namely, Co-ordinate Geometry or Analytical Geometry. But centuries ago this idea was used in the traditional architecture of India.

The Relevance of "Vastu Sastra" to Present Day Planning of Building and Habitat

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Anyone who builds a house like to have a happy family, good marriage, healthy and long life, successful career wealth, good luck etc.

Vastu Shastra spells out certain principles which when followed will create harmonious living and healthy life.

The shastra takes into account the : Pancha Bootha viz, Air, Water, Space, Earth and Fire to create this harmony.

vastu Shastra mostly reflects practical engineering principles. Few examples can be cited to prove this.

For example, while deciding on the site location, they recommend that a small pit is dug. The pit has to be refilled with the loose earth removed. If there remains excess earth after filling then it is considered good site for construction. If it just covers the pit then it is OK and if the loose earth is not enough to cover the pit then the site is not good for construction. This is nothing

but indirect engineering principle of compaction and consolidation of soil which is necessary for good foundation.

One can cite quite a few examples like this.

There are also contradictions in *Vastu Shastra* which do not find support from any Engineering books. The Shastra have become more complicated when astrological principles are built in.

There is literature to show evidence that the Chinese have also been practicing this principle in the name of *Feng Shui* to create harmony and equilibrium in living space. They considered the five elements viz. Earth, Fire, Water, Metal and Wood instead of the *Pancha Bootha*.

All these will be presented in such a way to highlight the good and bad aspects of *Vastu Shastras*.

Restoration and Preservation of Bathinda Fort

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Old building and old precincts are a part of history. They are gentle reminders of city's growth, evolution of life style, aesthetics, technology and crafts forgotten.

The city of Bathinda is the fastest growing city in Punjab and is emerging as an important commercial centre.

Being in Bathinda for the past seven years we could not see such a glorious heritage like the Bathinda fort lying neglected and so we have made an attempt to conserve and restore this cultural heritage.

Bathinda Fort is the most remarkable of Mahi or Mud Fort. One cannot miss seeing this lofty monument when one enters Bathinda from the Northern side. This is the only fort which has survived the ravages of times and was built for defence purposes.

It is situated at a height of 686.6 feet from the main Sea level. The brick used is said to be from Kushan period.

The Fort is irregular in shape. In plan its structure has 32 small and big bastion and the large Bastions extraordinarily massive

in size form the corners of the Fort. They are in circumference at the top.

It is surrounded by commercial and residential buildings.

It is aimed to preserve and restore the Fort to its past glory. It is suggested that new features like children park, museum restoration of Rani Mahal and providing open exhibition space be added for tourist attraction.

Arc-4

Lawrie Baker - Students Eye View

Jai Singh, Manish Thakuriya, Mehna Phadke, Sumit Gothi, Utsav Chakrabarti & Urvi Mankad

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From time immemorial distinctive architectural styles were not designed by ancient architects but from man's need for protection against nature, environmental factor and his necessity. Be it the log house of Himachal Pradesh or the circular huts of Rajasthan, they satisfied the dwellers in every way.

This is where Baker comes in. He rejected emphatically the international style that lingers so perniciously in India. He is conscious of the depleting resources of the country and has been tremendously influenced by the judicious way our 'backward' ancestors used exposed wood, laterite, brick etc.

We try to see the effect of Baker's works, his interpretation of tradition, technology and lifestyle on the three categories which matter most to him and through the eyes of one the categories, we ourselves belong to.

1. His clients especially the poorer ones towards whom his works are aimed at.

2. The people closely associated with Baker viz. Workmen and Mason.

3. The most important group, the students like us who remain as beacons to the future carrying and reviving these techniques with a hue of the modern, yet a shade of our tradition.

His grand mother in Scotland truly said, *Mettles make up a muttle.*

We are attempting an indepth study of his works and its influence on our thinking.

We will be making a video presentation which gives a peep into the revival of traditional ways and of low cost techniques as seen through the eyes of people ruminating over this new housing revolution throughout the country especially in Kerala.

Arc-5

Indira Gandhi Rashtriya Manav Sangrahalaya - A living Museum

Jai Singh, Manish Thakuriya, Meghna Phadke, Sumit Gothi, Utsav Chakrabarti, Urvi Manka

Dept. of Arch., MACT, REC Bhopal

We have taken up the study of Rashtirya Manav Sangrahalalya (RMS) because it is the first of its kind in India and second in Asia. Fortunately being in our own city it helped us to study the varied tribal habitats.

The main aim is to depict man

Man

Indian sub continent

India

Tribal Habitat Rural Habitat

The exhibition portrays a variety of life styles. The tribal habitat which is presented in the Sanghralaya has the same aura as its original domain. Green forests, valleys, plants, arid deserts everything is present. And what is not there has been

artificially created. The subconscious architecture which the tribal have evolved over the period is very thought provoking and needs to be analysed in greater depth.

We need to appreciate their understanding of various problems and solving them in logical manner even in the absence of Science and Technology. They used totally available resource whereas we are today dependent on Foreign technology.

Their architecture is perhaps more sustainable. They have established an adaptive relationship with their environment. It is interesting to note that the dwelling complex of Worli, Maharashtra has better cooling system than the ACs of today. The Assamese manage to have fire in the centre hall with floors and walls of Bamboo. The facts that the tribal dwellings remain

hot in cold winters and, cool in hot summers is very interesting.

Our job is to find out about this. We may come across more interesting facts in the process.

Arc-6 **The Modern Version of Traditional Building Technologies**

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Building Technology today has been thoroughly influenced by materials like concrete, steel and its allied techniques. This paper addresses the workers on traditional technologies in understanding that these recent developments are a mere transformation of our traditional technologies. If we are able to visualise a situation where these modern materials did not exist, we will be able to find the motivating factors that enabled our ancestors to evoke the said technique in their Virgin form.

The two examples that are used in this article are:

1. Brick Panel Technology
2. Ferro-Cement Technology

Madras Terracing Versus Brick Panel Terracing

The Central Building Research Institute (CBRI) has formulated brick panel terracing recently. This is a roofing technique where the traditional wooden rafters of Madras terracing is replaced by small size joists (RCC) and the traditional process of pasting of bricks on edge is replaced by precast panels made by about 16 to 17 bricks of normal size. There are some major difference between the two. One striking difference is that

brick panel permits the centre to centre gaps of about 120 cm. While in Madras terracing the wooden joists are placed close together. This is made possible by providing two 6 mm rods length wise as reinforcement to the panel.

Ferro Cement Technique

It is a variation of RCC where instead of bars as reinforcement, chicken mesh are normally used for reinforcement. So permit aggregates to get through the mesh, reinforcement stone jelly chips are avoided and only graded Sand is used as aggregate.

The author has examined the building technique of a village Karapadi located on top of a steep hill. The place is totally inaccessible because the slopes are so unfavourable. But the ancient homes were found to have thin walls of 1 inch thickness walls built using the Ferro Cement technique. The houses have survived for over 50 years.

A scientific analysis and study of the traditional techniques would help in using the local materials for contexts which were not thought of earlier.

Arc-7 **Housing Efforts Through Traditional Technologies for Poor Tribals in Valod Block**

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Although shelter is a basic recognised right of every man, there are approximately 100 million people in the III world who do not have adequate shelter. Even the Government which claims to meet the basic shelter and related needs of their people depend on NGO's for help.

Valod is in Surat District, Gujarat. It is a taluk of 40 villages and 78% of them are tribals. Vedichi Pradesh Seva Samiti (VPSS) identified 5500 families for upliftment through co-operatives, dairy, farming, fisheries women development programmes, etc. VPSS wished to implement two programmes - housing and health. They prepared a detailed blue print of housing project (Housing Assistance for Antyodaya Families (HAFF-VALOD). This project is financially supported for ECE, Germany.

From time immemorial people have used natural materials like wood, Bamboo, mud, thatch for building houses. With deforestation these materials have started disappearing or become

costly. They were compelled to build low height houses, inadequate ventilation, keeping cattle inside the house. Basic facilities were almost absent and hence the conditions were very unhealthy inside and outside the houses.

Aims and Objectives of HAFF-Valod Project

Improve environment, integration, internalising benefits, appropriate construction technology, Peoples Project, Replicability, Training.

Initially housing was done with traditional materials like burnt bricks, green bricks, mud etc. Sometimes materials were local but not the methods. We shifted from foreign materials, techniques to local materials, techniques.

Some of the experiment were with:

Brick wall houses with mud mortar, Stone Crete block wall method, and Rammed earth wall houses.

We observed the advantages and draw backs of traditional technologies. Slowly traditional construction methods were used after interacting with clients.

Major outcomes of our observations

The three ancient methods of construction are:

1. Traditional technologies were reliable and time tested for the local people.
2. Lot of participation and enthusiasm.
3. Less training.
4. Lot of non-cash labour can be used by taking advantage of people's wisdom and thus less cost.
5. Technology was simple, eco friendly and energy saving.
6. Lot of old material reused.
7. People's culture can be maintained by not imposing foreign ideas and technology on them.
8. Very few materials are bought from market and so very less market forces effect this technology.
9. Problems of old techniques can be replaced by introducing new techniques without disturbing the identity of traditions.

Cowball method

In this case self sufficiency in material and labour and so can be afforded by the poorest. 80% of material can be reused when they need to make new house.

Wattle and daub method

It is also one of the oldest methods, more sustainable to natural calamities. Local government agencies use this method and local contractors and people prefer this.

Adobewell method

It is not a traditional method but is very popular. six to even days to complete and they are long lasting.

It is said to note that few agencies are making use of traditional technologies. Even advanced nations are trying to preserve their traditional science and technology wisdom. Agencies like IIT, IIA's should act as catalysts between grass root level agencies and local government bodies to effectively use our traditional methods and techniques.

Arc-8

Vastu Sastra

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Culture and heritage are different but related to each other in one form or the other. Architecture is one way of expressing culture and heritage of a country or civilization. In Indian Architecture vastu has been used from ancient period. Even the Moghuls used the same basics of vastu principles.

What is vastu sastra?

Vvastu tells us how to design building. It tells us the direction and placement of doors, windows, overall site etc.

Temples are strictly constructed based on vastu. Town planning does not use vastu. Residences use to some extent.

Vastu is related to Sciences like Cosmology, Geology, Astronomy, Geography and Architecture.

House Architecture can be divided into:

1. Residence of middle class people
2. Residence of Kings
3. Temples
4. Public Building
5. Town Plannings

The first house evolved with the tree as its model.

Role of Vastu in Hose Architecture

Vastu has principles laid out for the selection of site, soil, building materials to be chosen, direction of elements of the house and the number of storeys to be built.

The masonry should be such that when viewed through the Aualambaka (one of the 8 fold sutras) it should be correct. Defects in masonry bring about miseries, misfortunes, calamities etc.

Temple Architecture

Temple Architecture in India is symbolic of the spiritual outlook of the people. From an architects' point of view Vimana and Prasada are the two important technical terms. From the five shapes of Vimanas - Vairaja, Kailasa, Pushpaka, Manika and Trivistapa which Brahma created, he made the prasada which is *seat of God*.

The various parts of temple correspond to the parts of human anatomy.

The important structural limbs of the Prasadas are

1. Adisthana (Pitha)
2. Garbhagriha and
3. Superstructure

Role of Vastu in Temple Architecture

It lays down certain principles for the direction and external location of the deities in a town and also the fact that only Vaisyas be the architects of temples.

Town Planning

Towns grew with a distinct and definite socio-political and cultural need.

Town planning comes under civil architecture. A town is a large village which is meant for habitation. Whereas a fort is mainly for defence and so a protected town.

Role of Vastu in Town Planning

Vastu lay down certain rules regarding the position of the town, the number of streets it should have, basic requirements like shops, parks, drains walls, etc. to be incorporated. It also lays down the street wise distribution of population - depending on their profession.

Conclusion

Today Indian Architecture has become modern. Our endeavor is to break away from the western ideas and principles and to revive the golden rules of the past which were used by our ancestors. We will be presenting a detailed paper along with slides.

Arc-9 Tradition, Housing and Technology Challenges of 21st Century

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Gandhiji's concept of khadi was not supposed to be a brand name of a consumer item but a concept to reach all aspects of life including housing. Perhaps he is the best known environmentalists along with millions of unknown environmentalists - agrarian and tribal people of India.

Technology has three elements Resource, Process and Energy. Any man made product from stone age to the space age involves these elements.

Some scholars believe that the great pyramids were built for development of mystic powers. Bhakti which originated in India is supposed to give the same kind of powers as one received inside the pyramid.

Resource

Any civilized society has division of labour. In today's modern western society, market economy, is the latest powerful weapon developed by industrial civilization to colonise the resource.

In India one witnesses diversity in various things, but the people built houses based on their requirement and climatic conditions etc. But today the centralised powers have taken away not only these resources but also the power to decision of the people.

Process

In the building sector, harder materials like cement, steel, glass, plastics have replaced the natural materials like earth, stone, bamboo. Machine has come to replace man power. The new technology has not failed in taking away people's power to decide and freedom of action in housing.

Energy

Modern technology is causing depletion of ozone, destruction of forest, flora and fauna. The reality is that the production of new building material at such high cost of energy is not an answer to provide shelter for the entire population.

Sustainable development

Sustainable development is a misnomer today. How could modern technology which has brought disaster to environment and ecology ever achieve sustainability. Sustainability should take minimum from earth and exclude accumulation and profiteering. This awakening should come from people voluntarily and not with compulsion. It may be possible by controlling production for it is the key to the technology. For that the corporate society has to change its concept and language.

Production

What is production? Man cannot really produce anything. He only processes that which he receive from *Srushiti* - Nature. The modern world treats population - as mass production by human machine.

Performance

Why is the modern civilization materials of harder and permanent nature? This crave for performance is born out of fear and insecurity.

Housing is not permanent it is an action. The settlement however continues. Birth, death and regeneration in India are accepted as a cycle of life. Life does not end in death. This finds expression in folk art and architecture. Traditional housing is planned, constructed, expanded, maintained and finally destroyed to be built again.

It is an intrinsic understanding for an Indian that Shiva opens his third eye to destroy and regenerate. There is so much to learn from India.

The West are craving after Yayatis boon of performance.

There was no industry in the present sense of the word in the olden days. Man's basic source is his intelligence, his energy and his ability to work with his hands.

When KVIC starts making Khadi from synthetic fibre, it only displays bankruptcy of creativity. Housing for the Indian is not a finished product, but a sacred action which is born out of mother earth, grows, is cared for and goes back to earth to be born again and again and thus achieves not performance but timelessness.

This is reversal entropy and a challenge of the 21st century.

Arc-10 An Engineer's Experience with Traditional Technology

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Of late, there is a growing awareness among the public to have their residential buildings or industrial complexes or other buildings built according to Vastu principles.

In the recent past various agencies have organised seminars on vastu. Vastu Vedic Research Foundation, Madras organised the First International Seminar on Science and Technology of Vastu two years ago. Following that many seminars at National and Regional levels were conducted by many an agency. These activities go to establish the eagerness of the public in general and practising Engineers and Architects in particular to go in for Vastu.

Added to these, the World Health Organisation's identification of *sick building syndrome* in modern buildings and its anxiety to find solutions to such ailments can be taken as indicators for giving new orientation to modern design concepts. Scientists have started examining old buildings and recently built buildings designed according to Vastu principles. They have studied the energy flow and established that intensity of energy is in its peak at the Brahmastan or at the centre of the main built space. It is really amazing to know that our shastras had spoken

of this fact many thousands of years ago and prescribed code practices as to where the living spaces are to be located in a building layout with respect to energy flow so that the inhabitants may live in harmony with subtle and gross nature and hence lead a peaceful life.

Vastu shastras say that the four quarters falling on the four corners of the square or rectangular layout of a building conform to space, air, fire and water, the earth here being the supporting element of the built space. The position of these elements in a building layout is the basic criterion to decide the placement of various utility spaces such as Kitchen, Bed, Living, Pooja etc. in a residential building, according to Vastu shastras.

The pseudo Vastu pandits who have risen in large number now, dictating remedies without basic knowledge of science underlying them do the real harm and their functioning would tantamount to cheating the public. Experts in Vastu shastras with strong theoretical knowledge backed up with practical experience alone have to be consulted to have authentic and scientific directions. The details are discussed in the paper.

Arc-11 Timber used by Traditional Silpis in the Construction of Dwelling Houses and Temples

P. K. Ponnusamy

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Man's life started in Forests. As early as the stone age, when man was a savage he subsisted to a great extent on fruits and roots of plants. He lived on tree top. The plants provide food, medicine, shelter, timber, clothing and fodder. Thus, plant becomes the best friend of man. Gradually man started improving his dwelling place and the modern man lives in good houses.

Man's progress made in his civilisation has led to the birth of Vastu Sastra. This graha vastu silpa is a portion of Sthapatya Veda. There are many branches in Silpa sastra and one such is

Kasta (wood) silpa.

The role of traditional silpis in wood silpa is very great. This shows the importance given by silpis to wood.

Therefore, it would be interesting and thought provoking to know about the profound knowledge the silpis had about the use of timber in dwelling houses and temples from the hoary past. The details about building houses, temples, carving musical instruments, idols by timber are given in the paper.

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This is a very difficult but interesting subject. According to tradition, this may be classified under two major heads, namely physical and spiritual. The meaning of the title is taken as how a building has to be designed to prevent negative factors and bring in positive ones into built area. This is response or sensitivity of building to environmental factors.

Physical factors which affect a building may be stated as,

1. Location of a building such as hill top, hill slopes level ground around the hill, Valley, Forest, Agricultural land, Marshy land, desert, River bank and sea shore.
2. The house building is sensitive to soil condition. Use of building materials such as brick, stone, timber and lime.
3. Structural design with respect to foundation, wall thickness and roof loading.

4. Natural forces like Cyclone, Earthquake, Volcanic eruption, Heavy rains, excessive heat or rains.

5. Quality of soil sea breeze.

Subtle Factors

- (i) Arrangements of rooms and open spaces.
- (ii) positioning of doors and windows and ventilators
- (iii) Orbital and disorderly raising of walls in such a building
- (iv) Placement of rooms and location of amenities.

How to avoid negative effect of these factors on the building and the indwellers.

Traditional architectural Buildings are very sensitive to all these factors. For this the designer himself should be sensitive enough to understand the effects and ward off problems.

Marabuser Manai Kattidangalum, Ikkala Chirpugalum Community Based Building Construction and present day Sthapathis

T.N. Akhara Sthapathiyar

Poompuhar 609 107

This paper deals with the building materials. It also deals with the makers of those buildings, known as *Sthapathis*.

Included as paper no. 1 in the Tamil Section.

Vaastu for House Construction

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Vaastu is traditional Indian Science which defines the qualities of a good house.

In house construction, the site selection, Aaya determination, front door direction, other doors number and position, position of the windows, beams, pillars, their number and position, latrines and bath rooms portion etc. are the main features for which vaastu is adopted. Mainly Aaya determination is focussed upon in this essay.

What is Aaya? Aaya means life-point, so Aaya can be taken as the life-point of a house. There are eight types of Aaya: 1) Dhwaajaaya, 2) Dhumaaya, 3) Simhaaya, 4) Svaanaya, 5) Vrishabhaaya, 6) Kharaaya, 7) Gajaaya, 8) Kakaaya. Among these eight, some give good results and some others lead to bad results. Hence good Aaya is to be set. To achieve this, area of the house is needed. This area is called as *Padam*. The length of the house is measured between the middle point of the

thickness of one end wall and the similar point of other end wall. Width is also measured between the middle point of the thickness of one end wall and the similar point of the other end wall. Length and width are to be expressed in yards. *Padam* is obtained by multiplying length with width. One should see that good Aaya must be derived from this *Padam*.

There are fourteen fundamental aspects of a house which can be calculated from *Padam*. viz., 1) Dhanam, 2) Runam, 3) Vaaram (day), 4) Thithi, 5) Nakshathram (Star), 6) Aayam, 7) Aayushyam (life period), 8) Amsha, 9) Dhikpathi, 10) Yogama, 11) Karanam, 12) Bhutham, 13) Kulam (caste), 14) Lagnam

Selection of a *Padam* to get all these fourteen aspects suitably, is called determination of Aaya. This is also called as *Chathurdhasa Vargu Aaya determination*

From *Padam*, if all fourteen aspects are not possible to set suitably, eleven aspects may be the next target; if eleven aspects are not possible, nine aspects may be considered; if nine aspects are not possible, at least six aspects are to be set

in the best manner possible. These are respectively called Ekadasa Vargu, Nava Vargu and Shadvargu Aaya nirupana. The method of calculating Aaya, Dhanam & Padam would be discussed in detail while presentation.

Arc-15 **Relevance and Need of Traditional Artisanhip in Panchshilpas Backed by Ancient Science and Technology in the Modern Sector**

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Every Vishwakarma as an expert artisan in his trade viz, Carpentry, Blacksmith, Metal Crafts, Chariot making, Sculpture and Jewellery. He has a Traditional Science and Technology behind his profession and it is not that these artisans function according to their own fancies and ideas. This science and technology is broadly known and recognised as *Vaastu Shilpa* which is claimed to have been handed over to these divine artisans by the great Pancharishis, Manu, Maya, Twastra, Shilpi and Daivagna created by Bhagavan Vishwakarma the creator of the entire universe from his own *Amsha*.

There are enough proof in the Vedas and smritis to show that Lord Vishwakarma created Brahma first and therefore this Brahma is called the *First born* meditating after the Supreme Brahma as received his grace through the sound of *OM* and later on other letters conveying the knowledge of the Vedas. Brahma taught it to Marich Atri, Angiras and other Rishis as *Sruti* and they taught the same to others. (A concept of Hinduism p.83 by T.K.Mukundan, A Bharatiya /vidya Bhavan publication). Along with Brahma, Vishnu and Maheshwar were created with the duties of *Creation, Preservation & Destruction* cast upon them respectively.

Vishnu's job was the most important and onerous and in order to assist him, Pancharishis-Manu, Maya, Twastra, Shilpi and Daivagna who were proficient in Pancha Shilpa, were created. The descendants of these pancharishis are Viswakarmas who are traditionally efficient in all these panchashilpas and they

serve the humanity at large for affording all facilities required by humans for a happy life.

Unfortunately, in the meantime these viswakarmas fell into bad days owing to jealousy and hatred perpetrated against them by *Priestclass* who took over the pooja rituals from Viswakarmas after the idols were consecrated and placed in the temples for Veneration and pooja. The earlier Viswakarmas who were doing poojas also as told us by *Shilpa sara* could not find time to continue these poojas owing to their heavy preoccupation in building temples, carving idols etc., handed over the same to *Priest Class* who later on divided the Agama Shastra into 3 parts-Saivism, Vishnuagama and Shaktagama-and divided themselves into 3 groups of Agamies. It is only thereafter that these viswakarmas were put into untold misery owing to the false claims of the priests class as superior to viswakarmas and even claiming that these priests were giving directions to these artisans as to how an idol is to be carved as to how a temple is to be built and as to how an idol is to be consecrated and installed in the temple with rituals like Pranaprathista, Netronmelanna etc.

An Artisan Development Corporation exclusively for these trades belonging to Panchashilpas possessing the ancient traditional science and technology should be formed by Govt. to be managed by Artisans themselves when, the S&T will automatically be modernised on the traditional basic principles and make the artisans into true technocrats.

Arc-16 **Traditional Housing Patterns in Orissa**

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Orissa presents a wide variety of housing types and housing patterns having distinct characteristics in design, layout, decoration, make etc, reflecting the socio cultural life style and the aesthetic sense of the people of different regions. In rural areas of Orissa, dependency on traditional building materials is almost complete. The area specific characteristic in house construction has stemmed out of the socio-cultural habit, prevalent in a particular region, of topographic and climatic condi-

tion in that area and to a large extent, of the variety and extent of bio resources available in that particular materials. In Orissa at present there is a remarkable transition in rural and urban housing. The varied house types and lay outs are subject to various kinds of pull and push and stand on a cross road. The design and lay out of houses vary from district to district. The functional facilities of the households are determined by considerations of climatic factors, socio cultural needs and geo-

graphical situation. Tribal housing patterns have distinctive style and are entirely dependant on environmental factors. Ventilation facilities play a considerable role in creating a healthy living place. In different parts of the state indigenous people have their own concept of ventilation. Housing in forest and deforested areas have their own problems. Various house development alternatives are being proposed and practiced by

several NGOs. Locally available materials and traditional know how and expertise are the keys to Orissa's housing problems. These will lead them to the height of psychological comfort and over all satisfaction. Then only the society at large will be able to provide them with Baikuntha Saman Ghar, houses which can be compared, according to Oriyan folklore, with the abode of Vishnu. The time has come to look back.

Arc-17

Preservation of Traditional Marathwada Architecture in Maharashtra

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Traditional architecture is part of local culture. In each area it has evolved over hundreds of years. It is in harmony with the local environment which in turn governs the lifestyle, resource, climate patterns etc. As a result it is location specific. Hence, it is different in different parts of the world. In the urban areas of the world, however, the architecture has detached itself from the traditions. The urban architecture is what may be called modern architecture. Since it has little to do with the local factors there is little variation between that in one part of the world and the other. But things have changed a little in the rural area, especially in the third world countries.

People in the rural areas of the third world countries even today continue to live in harmony with the surrounding environment. They depend for most of their needs including housing on the local environment. As a result what they build continues to be sustainable unlike what their urban counterpart builds. In addition the traditional housing is a strength of the rural community since it is self sufficient in that regards. The houses are generally built using predominantly local materials either through self help, or through a combination of self help and skilled local artisan intervention. In other words there is little or no dependence on the outside system or individuals for housing.

But in the recent decades in India and elsewhere there has been outside intervention in the rural housing scene. This has been in the form housing for the poor or the post disaster rehabilitation. In Indian barring a few exceptions this type of construction has not been location specific. In other words the houses built under such programme have been built with high use of non-local materials and skills. The house forms employed in

this have little harmony with the local environment. The space planning has slittle to do with the local life style. These inappropriate interventions have been instrumental in creating aspirations in the community at large which are not sustainable. This process also results in long term hardship to the people. Often this disturbs the traditional housing process by shaking peoples confidence in the traditional materials and skills. This, if continues in a particular area, could rob the community of its strength to take care of its housing needs.

Marathwada is one such community where such processes commenced during the post earthquake relief and rehabilitation programme. A rehabilitation programme of an unprecedented scale has been initiated by the government across thirteen districts of the state. The way the programme has been conceived it has already done much damage to the traditional housing process. It is not only adversely affecting the ability of the community to house itself but also in the process it is robbing it of long term safety from the future quakes.

Asag has taken up work in this area during the last two years to reduce this damage by identifying the weaknesses in the traditional house construction in the context of teh increased seismic activity in the area. With the help of *Taru* of New Delhi and Prof. Arya it has also identified the ways to strengthen the traditional haouses to ensure the safety of the most number of people in the area. *Asag* has taken up information dissemination as well as training programmes to prepare the community stand on its own feet and depend as possible on the outside intervention. In the process ASAG has advocated the use of the local materials and construction techniques, and also the local space planning.

Metals & Materials

*Rajib Chakravorty**National Service Scheme, Regional Engg. College, Durgapur-713 209 (WB)*

Iron and steel produced during the 18th and 19th century in India was of very high quality and it was regular item of export. On account of varied socio-technical reasons, indigenous processes had a decline. However, the know-how still exists with some of the tribes in our country. A detailed study of the existing processes with a view to induce technological improvements and economic sustainability would be very helpful in preserving the heritage as well as supplementing the

industrial needs, particularly in the unorganised sector.

The choice of appropriate technologies based on local resources and needs, environment and revival of our heritage and proud values in some conceptual and production areas may be very helpful in this connection and proper interaction of all concerned including NGOs, would be able to harness the true potential of such processes. This paper attempts a review of the above aspects.

Saga of Wootz Steel Sword*B. Prakash**Dept. of Metallurgical Engineering, Institute of Technology, Banaras Hindu University, Varanasi-221 005*

Ancient Indian knowledge about the Fe-C alloys and their thermo-mechanical properties dates back to 1st m.B.C. or even earlier. They had mastered the technology of carburization, forgewelding, hot working as well as effects of heat-treatment on high carbon steels. Molten Fe-C alloys i.e. wootz steel was also produced for the first time in the country at Konasa-mudram near Hyderabad, Salem near Mysore and many other centers. Wootz steel ingots have been recovered from Taxila excavations, and this technology was in vogue till the end of 19th century. Wootz steel swords or Damascus swords were known for their properties like hardness, toughness, flexibility and the typical watering mark on the blade surface.

The paper describes the process of manufacture of wootz steel, its thermo-mechanical behaviour and heat-treatment of the steel swords and other weapons. The exact procedure of forging and heat-treatment of wootz steel or Damascus swords was a highly guarded secret,

which only Syrian blacksmiths from Damascus could learn from Indians. They used to travel to India to purchase wootz steel ingots and carry them home to manufacture swords and other war weapons to sell them to the Europeans, thus Damascus sword gained worldwide publicity and demand.

The literature survey has shown that for the past few centuries many attempts were made throughout the Europe to produce indigenous swords having similar properties and finish but they failed. Only during the past two decades, some aspects of the secret of working of wootz steel or ultra high carbon steel having carbon percentage in the range of 1.3 to 2% has been decoded and steel blades having nearly the same properties and surface finish could be produced. This paper highlights some of these attempts and the results which reveal the supremacy of the ancient Indian steel makers and blacksmiths.

Lost Wax/CTRE' Perdue Process Practiced at Swamimalai, Tamil Nadu and Mannar, Kerela*R.M. Pillai, S.G.K. Pillai & A.D. Damodaran**Regional Research Laboratory, Council of Scientific & Industrial Research, Thiruvananthapuram-695 019*

Metal art in India goes back to antiquity. The well known figurine of a dancing girl found in Mohenjo Daro and that of Mother Goddess discovered at Adichanallur in Tamil Nadu are the existing examples to confirm the above and the high degree of skill possessed by artisans of those days. These were shaped by Madhuchchhishta vidhana or Lost Wax technique or Cire' Perdue process which is now widely known as Investment Casting process. The ancient casting technique is still being widely practiced without much alterations in different parts of our country. This presentation intends to bring out the salient features of the studies conducted by the authors on the process practiced at two working sites, viz., Swamimalai in

Tamil Nadu and Mannar in Kerala for making icons and bells, utensils, lamps etc. respectively. In addition, metallurgical characterisation carried out on the samples collected from the alloys used for casting these revealed that the composition of the copper base alloy utilised for icon making is Cu-8.74%, Zn-4.45%, Pb-0.98% & Sn. On the other hand, a high zinc containing alloy viz. Cu-33.75%, Zn-4.25%, Pb-2.35%, & Sn was used for making utensils. Constitution of the alloy is changed depending on the article to be cast, namely, addition of gold and silver for special purpose icons and use of Cu-Sn alloy only for bells and certain utensils.

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Gold is perhaps the first metal to be known to man, as it is one of those few metals to be found in native state. Although this metal was useless for weaponry or hunting tools, it always had a high value due to its attractive colour, lusture and extreme formability as well as corrosion resistance. The latter made it particularly useful as a standard for trade and as reserved wealth. Its limited availability made it one of the dearest materials to be used only by royalty and rich people.

Archaeological evidences suggest the knowledge about gold in Bharatvarsh (Greater India) way back from third or fourth millennium B.C. Geological studies have shown that gold deposits of well known Kolar gold field in Karnataka was worked right from this period; and it has been the main reservoir of gold in India. However in the northern India gold was worked at several other places including Singhbhum in Bihar. A number of rivers had limited alluvial deposits along their banks and placer deposits near their Udgam (origin). The river Suvarnarekha is often thought to have got its name after the alluvial deposits obtained in its bed.

Pali literature had used words like Jambonadsuwarna (reddish gold Suwarnasikta, Suwarnabaluka (gold grains), Suvarnachurna (gold powder), from banks of Jambunadi-one of the major rivers in Buddhist north India (now identified as Tibet), with its origin near Kailash and Mansarovar, located to north-

west of Tibet. From ancient times right upto 1910 A.D. Lhasa had been a major market for gold extracted from Mansarovar placer deposits.

The present paper attempts at throwing some light on the reserves, extraction techniques and processing technology for gold, in Buddhist India. Pali literature uncovers a number of much sophisticated process for gold enrichment starting from washing and other hydrometallurgical upgradations, gravity separation etc. right upto fire refining, alloying and smithy involving various forming techniques which were very well developed. Since gold was always looked at as a standard of wealth, a number of techniques were developed to measure purity of gold. Although the literature is much rhetoric, its careful interpretation shows that in ancient India gold metallurgy was quite advanced. The paper also compares these ancient techniques with a few of the current methods used in gold metallurgy. It is interesting to find that many basic properties of materials were known and were successfully exploited with high level of professionalism for getting desired results. The art of gold alloying and smithy was thus preserved and developed from generation to generation by goldsmith families. Pali literature identifies them as Suvannakar, Sovannakar, Kammar (Karmakar), etc.; also grading them by these words.

Ancient Gold Mining Activity in Sonbhadra District of Uttar Pradesh and Adjoining Sidhi District of Madhya Pradesh

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Gold and Silver together formed the main core of the jewellery industry and a potential resource for prehistoric man and the succeeding civilizations which governed vast tracts of this universe. Gold was most likely one of the earliest metals to be extracted partly as a result of its shine and a heavy metal having a density of 19.3. It is usually found in its native variety and occurs in gold bearing quartz veins but is only a minor constituent of the igneous rocks. The rare ores of the gold are calverite, Krennerite, Petzite & Sylvanite. Gold sand is also available in several rivers which has been panned by man through the ages. Gold was known to men in nugget form from the earliest times. Old mining activities of gold are reported from the Kolar, Hutti and Gadag regions of Karnataka and also from Chottanagpur plateau.

For the first time we recently recorded evidence of ancient Gold mining activity from Sonbhadra district of U.P. and

adjoining Sidhi district of M.P. A large number of grinding stone blocks, pestles, mortar, stones for sharpening chiesel and a chiesel adjacent to huge dumps of old excavated rock material from the large pits, trenches and underground inclines have been recorded from these sites.

The presence of grinding stones along with a nearby source of water e.g. streams etc. and complete absence of slags and the general geological setup all suggest that the noble metal gold has been mined from these localities and have been beneficiated by simply powdering the mineralised rocks followed by panning in the nearby streams because gold is chemically more inert and occurs generally as native metal.

The abundance of stone artifacts with presence of iron tools suggest that this mining activity is from iron age through it needs to be verified by further detailed studies.

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How the metallurgical skill developed during ancient times is not easy to recapitulate after thousands of years. However the traditions of the societies preserving their past as handed over to them through generations may help get a real glimpse into the past through them. Presence of pre-industrial iron working which survives even today, in certain parts of the country, provides a precise clue to the understanding of ancient metallurgical process and practices. The limitations of archaeological data may effectively be substituted through a proper study & observation of working of these societies residing in remote parts of India. The present paper aims to fulfil a lacunae in our knowledge of ancient technology surviving traditions.

The ethnic group residing in the Chhatisgarh Dist. which still smelts and forges iron objects has been traced and selected for a close study by us. These groups, it has been observed not only smelt iron from locally available ores but also apply a variety of techniques of forging iron. They have an excellent knowl-

edge of minerals and a good understanding of behaviour of metal. The techniques of carburization, quenching and tempering were learnt by these social groups and selectively applied by them suitably. The other important point emerging from this study is that while one group specialises in wrought iron technology, the other is adept in manufacturing white iron or *Charka Loha* as they call it, still others prefer the magnetic river sand for high purity iron. They have successively designed and modified their furnaces to suit them. Certain ethnic groups specialise in production of specific variety of iron or steel.

This could have been the situation in remote past also as suggested by the archaeological data which has not been interpreted this way so far. We have some across a variety of furnace remains in excavations. How this is to be interpreted is open to discussion and suggestion.

Thamizhagathil Irumbu Thozhil - Oru Parambarium Traditional Iron Industry in Tamil Nadu

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History & Speciality of iron in Tamilnadu is described in this paper.

Included as paper no.2 in the Tamil Section.

Rathinahagalai Patri Oru Kannottam - About Gems

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Various types of Gems and their jewellery are described in this paper.

Included as paper no.3 in the TamilSection.

Brass & Belmetal Craft Traditions and the Kansari Artisans of Orissa - A Status Paper

Kansari Samaja Unnayana Parisad

Bhubaneswar, Orissa

A group of people in the stage of Orissa by way of social mobility adopted this nonferrous metallurgy craft as their traditional and communal means of earning livelihood and eventually were termed as *Kansari* Community (Braziers). They deal with brass and bel metals and form a distinct descendants of the Viswakarma Community.

These brass and belmetal smiths called *Kansari*'s form their caste councils with an objective to maintain caste solidarity to provide social security and for improvement of the craft as well as the social status.

Unlike other craftsmen, the *Kansari* do not depend upon the locally available raw materials for their craft. They procure the

basic metals such as Copper, tin and Zinc from outside Orissa and alloy them into the required raw material.

The traditional craft of brass and belmetals are practised by the Kansari community which are not only found in Orissa, but also in various parts of Indian sub-continent with different appellations.

The age old traditional Brass and Belmetal craft has fallen prey to this social and attitudinal metamorphosis. Though modernisation is necessary to keep pace with the present situation still the basic technology is to be kept up with some relevant and necessary modification.

Mtl-10

Pon Anikalangalum, Paniyalargalum Gold Jewellers and Jewellery

V.N.Gajendran

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Details about gold jewellery their speciality, uniqueness are given in detail in this paper.

Included as paper no.3 in the Tamil Section.

Mtl-11

Technology in Indian Artisanal Industries: A case study of the Kansaris of Bengal

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Technology in Indian artisanal industries has been generally considered as something not responsive to market forces and so unchanging over the years. The unchanging character of the techniques of handicrafts production in India, repeatedly emphasized by scholars (Weber, Alaev, Gopal, Raychaudhuri, Bhattacharyya and others) has been attributed to the inhibiting influence of Hindu theology and the caste system. The Soviet scholar L.B. Alaev, studying non-agricultural production of medieval South India, thus argued that technological improvements were to a great extent checked by caste rules, which also fixed the methods of work. What followed, therefore, was the total absence of the inter-sectoral diffusion of tool techniques (Habib) and *technological stagnation* (S.Gopal), which in its turn helped the preservation of *old order* in Indian artisanal industries.

Most of the earlier studies on this subject, however, consider the question of technology in Indian handicrafts production from the European point of view, particularly in the context of the late-eighteenth century England's transition to industrial take-off. In most of these studies, therefore, the term technology is accepted in its post-Industrial Revolution English connotation, which covers all the activities associated with things technical; thus making no difference between *an abacus and a microcomputer* (Jean Jaquessaloman). On the continent, however, *technologie* is accepted in a different sense, meaning something specialized and more advance stages of technique. *La technique*, in pursuance of the old Greek definition of the term *techne*, actually refers to the system of making or doing

things, an art or craft.

With this difference in mind, the present paper seeks to re-examine the existing notion of 'technological stagnation' in artisanal industries with reference to some selected groups of artisans in Bengal. It concentrates on the Kansaris (braziers), which constitutes the second largest artisan group of the province, and refer to other groups only by way of a comparison. The Kansaris of Bengal produced a wide range of utensils, cheaper ornaments and similar other items from non-ferrous metals; catering not only to local demand but also to that of the adjoining regions. From the migratory craft of a microscopic caste group, called the Kansaris, in early medieval Bengal, its eventual transition to the second largest industry of the province in the late nineteenth century is indicative of an expanding demand for the Kansari's products over the years. Although aided partly by the declining price of copper, the basic metal of the Kansari's craft, the growth of the Kansari's industry also indicates considerable upgradation of their tool techniques which enabled them to produce cheaper goods for the market.

Based on a thorough investigation into the nature of changes in the Kansari's technique of production since the early medieval times, the present paper argues that *technology* in Indian artisanal industries did change in response to market forces. If such changes appeared rather slow and timid, it was because of a radical transformation of the production technique was never a pressing and unavoidable need in India. The paper concludes with a brief reference to the reasons of this slow change and the social role that this technology played in India.

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In India alchemy flourished in the medieval period. A belief that metals could be perfected to gold gave rise to metallurgical alchemy. Numerous alchemical texts which were written between the ninth and the sixteenth century AD by the alchemists give details of these so-called transmutation processes. A study of these texts disclose some exciting facts regarding the chemical-metallurgical knowledge and insights of the alchemist.

Metallurgical operations which were carried out with the aim of gold-making enabled the alchemist to accumulate new chemical data. Alloys with varying percentage compositions were synthesized. Variation in physical properties due to variation in the composition or the operation, was observed by them. Control of temperature was achieved by using different furnaces and fuels. Suitable apparatus was also invented to serve specific functions.

During their endeavour the alchemist discovered a number of processes, substances their chemical and physical properties and established primacy of India with respect to these discoveries.

The chemical-metallurgical insights revealed by the close study of some of these alchemical texts are noted below.

One whole chapter of Rasopanisad which is an eleventh-twelfth century text, is devoted to gold-silver making processes using tin. It discloses some important facts about tin and its metallurgy which were known to the alchemist e.g.

1. There are two physical modifications in which tin exists, white and grey; and tin has a low melting point.
2. Pure crystalline tin resembles silver and addition of little silver to pure tin inhibits the transformation of white tin to grey tin.
3. While synthesizing the alloys of noble metals, the noble metal is added during the second melting to get homogeneous alloys and to reduce unnecessary loss of the noble metal.

4. Arsenic compounds are to be avoided in tin metallurgy because even a small amount of arsenic renders tin very hard.

From the choice of crucibles of the alchemists is obvious that he had the basic knowledge of their construction and application. Not only could he construct a number of different crucibles suited for a specific chemical operations or a particular reaction mixtures, but he could also line them with various pastes to serve some specific function e.g. to supply acidic, basic or reducing atmospheres, to provide non-absorbant coating etc.

The author Rasopanisad describes a novel method for identifying the ores of gold, silver, copper, tin, lead etc. A small portion of the ore is mixed with various substances and a paste is made, it is then smeared on a copper sheet. The sheet then acquires specific colours depending upon the metal contained in the ore. The colours could be explained on the basis of the principle of displacement of a metal from the solution of its salt by one which is more electro negative in character and has more tendency to pass into solution; using the electrochemical series.

Further, antimony is called *Masikanjanadhatu* i.e. a metal obtained from Masikanjana or antimony sulphide, indicating to the possibility of his knowledge of antimony as a separate metal, at the time of the compilation of Rasopanisad i.e 11th-12th century AD. Another text viz. Rasendrachudamani of Somadeva, 12th-13th century text describes the method of separation of antimony from Stiknite using iron.

The article further discusses some more topics e.g. a gun powder mixture, *Dravananga* or the substances which help in the crucible reactions, etc.

Thus it is apparent that the medieval alchemical texts stand testimony to the extensive chemical-metallurgical knowledge of the Indian alchemist.

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The indigenous practice of making iron from iron ore and charcoal was quite prevalent at many places in India at the turn of this century. Since then, however, it steadily declined and by the time of independence, the practice was probably restricted to the central part of the country, mainly in the

Agariya belt. Even here the decline has been rapid, and one may now find only a few families in isolated pockets still practicing the craft. The art may disappear altogether before the dawn of the next millennium, if the present trend continues. The reasons for this are many: economic, sociological, political

and technological. The present paper addresses only a few technology-related issues.

The basic features of the practice are well known, though there are gaps in the understanding of the process. The furnace itself is a small shaft made from locally available clay and lasts for more than a season. The tuyere that is used, one for each heat, is also made of clay though of a special kind. Air is blown into the bottom of the furnace through tuyere using wooden *kettle drum* bellows and bamboo blow pipes. The raw materials are iron ore and charcoal. The furnace is filled with charcoal, set alight by introducing a burning ember through the tuyere and blowing air continuously with the help of the bellows. When the charcoal level starts to fall, alternate charges of charcoal and iron ore are periodically made, and the blow kept up. The ore gets reduced and the reduced iron settles down as a spongy mass into the hearth. The gangue gets fluxed with iron oxide and is tapped from the front or the side, through a temporary wall. After about 10 charges of ore and charcoal have been made, charging is stopped and the blow continued for some more time to consolidate the iron. At the end, the blow is stopped, the front wall broken and the bloom of spongy iron taken out. It is immediately forged to squeeze out the slag and consolidate the iron. The consolidated bloom can then be used for producing iron articles by reheating in a smithy fire using charcoal as a fuel and hand forging.

Given favourable socio-political climate, the economy and feasibility of the process depend on the economics of operation, and therefore profitability and marketability, and technological aspects especially alternatives for difficult to obtain resources or unacceptable practices. Due to the superiority of the product for agricultural and household applications, it has great demand in the rural market and even commands a premium vis-a-vis articles made in factories atleast at the scale it is being manufactured. The profitability therefore is primarily related to the cost of manufacture.

The contribution of cost of materials for the construction of the furnace and the bellows to the product cost is negligible since they are readily available. The primary cost is that of labour; even this has a small effect since the furnace has a long life. It is the operational cost which determines the product cost. Here again the cost can be broken into raw material cost and labour cost. Since the operator is the owner of the production unit, profit constitutes the returns on the labour of the artisan's family. Raw material cost is therefore the primary cost.

One heat, needing about an hour of set-up time and 3-5 hours blow period, typically produces an usable bloom of about 2-3 kg weight on a good day. The raw material requirements are about 10 kg of iron ore and 15-20 kg charcoal. When it is further worked to useful implements of about 1.5-2.5 kg weight one may need another 2-3 kg of charcoal. The ore at the mine is free, since the ironsmiths only mine from very small deposits which are considered nonviable in the modern economy. It does involve some labour for mining and transporting, and for beneficiation when necessary.

The cost of charcoal is the major component of the cost. There are several difficulties in estimating the cost of charcoal. Charcoal cannot be bought from the market since the charcoal from soft woods like sal, shaku etc. These woods are expensive, being used for the manufacture of furniture. They are also difficult to obtain since one needs to approach forest officials. Moreover buying charcoal from the market will transfer part of the already meagre profits to the seller. The smelter therefore makes his own charcoal, in small and inefficient batches. Even if one estimates a cost based on the market, it is clear that operational cost is prohibitively high. Added to this is the problem of irreproducibility of operation where a heat may fail to produce any product iron.

Based on the above discussion, the following studies and developments are suggested to tackle the immediate problem of sustenance of the practice. In the long run there may be several other areas in which efforts may be needed. These need to be taken up only after the sustainability of the craft is assured.

1. The smith operates the process at the limits of temperatures attainable by him. If for some reason there is a requirement of higher heat, like when air is moist, or when the gangue is slightly refractory, the blow may fail. This probably is the primary reason for the irreproducible and indifferent yield of the process. An additional control variable becomes available to the smith, if an increase in furnace hearth temperature is obtained by preheating the blast by 50-75 C. The flame playing at the top of the furnace can be utilised for this purpose. Modification of the blowing equipment are necessary and the effect on furnace working needs to be studied in the field.
2. Reasons for the requirement of charcoal from hard woods is not clear. The difference between charcoals from various sources may be of two kinds: physical and chemical. The physical structure of the charcoal may effect the rate of burning and the hearth temperature. The chemical composition, especially of the ash, may have a bearing on slag formation. Formation of a good flowing slag is considered very important by the artisans. Study of charcoal characteristics and its relation to furnace working is therefore essential. This may need extensive campaigns in the furnace. It may be noted that if the effect of charcoal is either in attaining higher hearth temperature or in requiring lower slag-forming temperature, the demand for special charcoal may be partly offset by the higher blowing temperature suggested above. Chemical changes can be effected by small additives in the charge or through the tuyere.
3. Even if the dependence on hardwood is removed, the requirement of large amount of soft wood from fast growing trees is still a problem. Cutting down trees in wooded areas will not be advisable, nor will it be permitted, in these days of enhanced ecological consciousness. The only option may be to allot degraded regions for growing these trees. Here again one lacks sufficient data

on the productivity of land on such wood cultivation. The data typically available are for the 'grow and clear-fell' method, which may not be an ideal way to grow wood on a sustainable basis. The alternatives of collecting dead wood and selective coppicing, which is what the village artisans normally do, is worth investigating for its productivity with long term sustainability. After all in such a method, the forest or the grove will be perennially standing, satisfying holistic expectations of soil conservation, water harvesting, clean air, various other forest products, etc.

4. Some improvement in the efficiency of charcoal making is necessary, from several points of view, chief of them being the cost and availability of charcoal. Collectivisation into guilds or cooperatives is an option. An innovative idea may be to use the heat available at the top of the furnace for charcoal making.

5. Another important area in which development is definitely necessary is to improve the air blowing system. Working on the bellows is extremely strenuous; younger members of the artisans' family clearly do not like it. Moreover, any attempt to increase the size of the furnace will necessitate a larger blowing capacity which the present system does not permit. If some preheating of air is to be effected as suggested above, higher pressures are necessary, which again the present bellows may not deliver. Simple options of using a hand blower or an electric blower may not be satisfactory, because at many places the artisans preferred to use the bellows even when blowers were available.

6. It may be advisable to use cheaper coal in the smithy. The effect of this on product quality however needs to be assessed.

Mtl-14

Sheet Metal Works:-Tanjore Art Plate (Relief work and embossing work)

K.P. Umapathy

Hereditary Sculptor

South Indian Sheet Metal Work is an example of our Traditional skill. Gold, Silver, Copper and Brass are widely used for these sheet metal works. Temples are even today giving employment to these craftsmen for making Rathas, Vahanams, Kavachams etc.

The earliest Viswakarmas found that Gold, Silver, Copper and Brass could easily be beaten into sheets in turn worked into shapes which became more complex as their skill increased. Today our knowledge of these ancient people's skill evidenced on the large scale on the copper tools, utensils and ornaments which have been recovered from the excavated remains of olden cities.

Relief Works

The following tools are generally used for sheet metal works. (1) Hammers, mallets of various shapes made from wood, metal and other materials (2) Tin man's snips (3) Pickling tank.

The most important techniques which can be carried out with the tools mentioned above are hollowing, raising, planishing, chasing and chiselling.

Copper and Silver are very ductile and both metals are stretched when hammered.

To obtain a design in one side of the sheet, we should work in the reverse side. It is time consuming as well as speciality of this work. In most cases, the pattern or design is first drawn on the sheet with steel scribe and hammer in the main and outlines

of the pattern/design is followed carefully with curved and straight tracing tools then the good effect is obtained by the use of planishing, matting and texturing tools. This process continued for at least ten times to obtain good designs.

Nowadays, craftsmen are doing leaf designs and geometrical patterns instead of figures of God and Goddesses. The reason behind this is the lack of knowledge in Silpa-Style Drawings. Shilpa Style Drawing is most important for this type of work as this is traditional and appreciated by all in India and abroad.

There is lot of similarity between stone carving and sheet metal work in designwise. Also the measurements explained in our Shilpa Sastras are to be followed. For this traditional skill and practice is required.

Tanjore art plate: Another interesting craft combining three metals viz Copper, Brass and Silver are called Tanjore Art Plates. This craft was an invention by Tanjore District born Viswakarmas. In simple, the intricate sheet metal work converted as a gift and utility articles.

The following are the processes:

1. Designing of God and Goddesses figures.
2. Make relief work.
3. Making round shape brass plates.
4. Embossing Copper and Silver (thin plates/sheets) sheets in the brass plates.
5. Polishing.

Technology of Bronze Casting as Revealed from Ancient Metallic Antiquities

History of Bronze Technology in South India

V. Jeyaraj

Chemical Conservation, Government Museum, Madras 600 008

This paper traces the history and the methods of bronze casting technology prevalent in India

Bronze casting technology seems to have preceeded iron in human civilization and had emerged in the near East as early as 3000 B.C. There are historical records of the prevalence of bronze casting technology in India even before 2500 B.C.

Bronze technology in Tamil Nadu dates back to the 7th century B.C. evidenced from the bronze objects obtained from excavations at Adichanallur, Tirunelveli district, Tamil Nadu, these objects are preserved in the Government Museum, Madras. Eventhough the bronze icon-making was in vogue during the Pallava period (close of 3rd to 9th century AD), the Pallavas have left too few of their icons to enable one to evaluate the full potential of the technological achievements prevalent in those periods. Inspite of the existence of the bronze technology of the Pandiyas (2nd century B.C. to 17th century A.D.) the

remains of bronze icons of that period are not many. During the region of the cholas (9th to 13th century A.D.), high quality bronze icons have been manufactured. Later, Vijayanagar Kings encouraged the art of bronze icon-making in the 15th and 16th centuries A.D.

Scientific examinations of these objects reveal that traditional casting was the technique in vogue. Bronze icon-casting technology by the traditional method is practiced even to this date at Swamimalai in Thanjavur and also in few other places in Tamil Nadu.

Scientific examinations of bronze objects reveal that traditional casting was the technique practiced throughout the past. This traditional method is practiced even to this date in a number of places in Tamil Nadu. Today the bronzes are oxidised to have dark look or treated with ammonium chloride to have patinated look by the artisans.

Development of Agricultural Tools for Small and Marginal Farmers of a Tribal Region in Bihar

**S.P. Chakraborty, *P.K. De, *S.Ghosh & **Mahesh Sharma*

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Warning signal of accelerating growth of population in India calls for immediate increase in agricultural production. Poor investment capacity of the farmers and low price of agricultural production as compared to industrial goods stands in the way to heavy investment as well as talents to agriculture. In addition, a lack of institutional set up in the field of rural technology is another major handicap to promote agricultural production. It is, however, heartening to note that this important and most essential issue creates now-a-days a rousing interest in the developing countries including India.

During the recent years, significant increase in agriculture production has been achieved in India through many avenues like use of better seeds, enrichment of soil by fertilisers and fair irrigation system. However, it is most surprising that comparatively less attention has been paid on improvement to agricultural tools. Now a time, has come to fill up the gap

between the rising growth of population and comparatively lower rate of agriculture production. Considerable increase in agriculture production can be achieved by the use of better tools and implements. Better tools provide ease and comfort in operation and thus increase the production capacity. Any attempt to meet these requirements, demand adequate supply of proper grade of material. Considerable research work at the National Metallurgical Laboratory has proved the utility of improved agricultural tools in Indian farming.

Various problems regarding raw materials, education in connection with forging, design of equipments and their proper heat-treatment were solved through active interaction between NML and Vikash Bharati. Another important phase of work carried out at NML was the development of an important material for plough share.

Bamboo

Indigenous Ecological Knowledge about Cultivation, Management and use of Homestead Bamboos in Kerala

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Bamboo is one of the plant components in most of the traditional homegardens of Kerala. It is being used extensively both in the domestic sector for house construction, handicrafts, making fences, agricultural implements and support to crop plants as well as in industrial sectors like paper mills. Since bamboo is a traditional crop in homegardens, one could expect a wealth of local knowledge contained useful information about cultivation, management and use of homestead bamboos. Several farmers of Palakkad and Thrissur districts with bamboo in their homesteads were interviewed to collect local knowledge from them and to identify problems constraining promotion of bamboo in rural Kerala. Some of the information collected are discussed here. *Bambusa arundinacea*, commonly known as thorny bamboo, is the most preferred species because it gives both thorny branches for fencing and poles for other purposes. To avoid the problems of thorns while working, farmers grow or maintain bamboo clump/s in the border of their homegardens. This will also allow farmers to grow other crops elsewhere in these homegardens. Bamboo with its shallow and fast spreading roots competes with other crops. In order to regulate its root spreading to other area, a trench of 2-4 ft. deep around the clump will be dug. The soil from the trench spread over the base of the clump provides nutrient to bamboo and thus more culms will be produced in the following season. Occasionally farmers put fire at the clump base which will help in quicker nutrient return from accumulated litter and in turn better culm production. Above-ground competition for light and space between bamboo and other crops of homegarden may lead to poor growth and yield by other crops. According to the traditional farmers, this problem can be solved by cutting the top portion of culms at about 10-15 ft. height. This practice also help in production of more and lengthy branches by bamboo from the basal nodes (due to the cessation of apical dominance) and thus farmers can get more thorns for fencing. Bamboo culms will be harvested either before the emergence of new culms (i.e., May-September) or 1-2 months after the new culm production. This practice allows new culms to grow without being get damaged. If bamboo poles harvested are

bent, farmers know how to make them straight. After removing branches, the bamboo pole will be laid on the flat floor. The pole will be fixed properly using pegs and putting weight on it until it becomes straight one. Some farmers put light fire also over the fixed pole to straighten it at a faster rate and to reduce insect damaged. Fencing activity is linked with the phonology of bamboo and socio-cultural systems of the farmers. In the central and dry agroclimatic zones of Thrissur and Palakkad districts, fencing will be done generally in the month of January. This is attributed to facts like maturity of thorns by that time, off-season of agricultural (paddy cultivation) activities and farmer's custom to decorating their homesteads with new fences festivals like 'the Pongal' which will be celebrated in that season. Bamboo thorns will not be used for fencing immediately after cutting. They will be allowed for 5-6 day for air-drying and later used. As a result of this, fence will retain its structure for a long time and also look beautiful without bending. Traditional farmers did not agree with the view that nothing could be grown under bamboo shade. They prefer or suggest to grow shade-tolerant annual crops like ginger, turmeric, mango-ginger, chillies etc. under bamboo shade. Their preference for growing annual crops is also because yield of such crops can be harvested before January when thorn cutting work will be started. If any crop is there near the bamboo clump while cutting thorns they may be expected to get damaged. Thus strategy of growing short duration rhizomatous crops as under-crops with bamboo helps both in proper land utilization and getting some crops mainly for household purposes.

This study has provided a better understanding of traditional knowledge about sustainable use and management of bamboo in homegardens of Kerala. Attempts are being made by the Kerala Forest Research Institute (KFRI) and the Natural Resources Institute (NRI) of UK through an integrated rural bamboo project to combine appropriate scientific knowledge with these traditional knowledge to promote bamboo cultivation and utilisation in rural community of Kerala.

Bam-2 Bamboo and its Composites for Rural Grain Storage Structures and their Performance

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The structural properties of bamboo strips from different locations of bamboo pole and of composites with sandcrete,

reinforced concrete, and linseed oil and ash matrix were studied. The stress-strain relationship of bamboo strips shows a

linear relationship and repeatability in several cycles. Unlike mild steel the bamboo does not exhibit yield point. The maximum tensile stress of 33 kg/mm^2 and elastic modules of $29.3 \times 10^2 \text{ kg/mm}^2$ were observed on samples from first layer of bottom portion of bamboo pole. The first crack occurred in the bamboo sandcrete matrix at a strain in the order of 4×10^{-4} in thicker specimen and 10×10^{-3} in thin specimens. The equations for predicting the crack strength of bamboo sandcrete matrix and bamboo reinforced matrix were determined from experimental data.

The results of bamboo sandcrete and bamboo reinforced concrete specimens indicated that the tensile strength of bamboo strips remained unutilized and therefore the matrix of different proportions of linseed oil and ash were studied for ductility and

ageing. Based on the engineering properties of bamboo and bamboo composites, the bamboo sandcrete bin, bamboo reinforced concrete bin, bamboo linseed oil and ash bin, bamboo clay and cowdung bin, bamboo polyethylene lining bin were developed and their performance were compared with untreated bamboo bin (traditional storage bin) together with the steel reinforced concrete and ferro cement bins.

Observations on the moisture content, temperature, germination, seed viability, insect damage, protein and F.F.A. changes indicated that the bamboo linseed oil and ash, bamboo reinforced concrete and bamboo sandcrete bins were found suitable for the storage of wheat and paddy both from the seed and food point of view during the storage period of 12 months.

Bam-3 The Role of Science & Technology in uplifting women Bamboo Workers

S.R.Azad

Madhya Pradesh Vigyam Sabha

In Madhya Pradesh, of the two lakh bamboo crafts people, more than fifty percent of whom are women and economically backward communities. Traditionally bamboo wares are hav-

ing to face stiff competition from aluminium and plastic products in the markets. This paper urges to take note of this cottage industry more seriously and suggests ways of doing so.

Pottery

A Study on Potters and Pottery Industry in South Tamil Nadu

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Indian Potter's wheel is perhaps the oldest mechanical device in human civilisation. The potters of India are well known for their high skill. It is estimated that there are 13 lakhs traditional skilled potters in India and almost every village has potters colony. Although they continue their traditional profession, the demand for conventional pots and pans has been decreasing day by day due to the introduction of aluminium and plastic materials. However, due to increased scientific knowledge, the horizon of pottery industry has considerably widened as it is now used for innumerable purposes from ordinary pots and pans to electronics which can be classified to include terracotta, earthenware, stoneware, porcelain, refractories, glazed ceramics, modern decorative art pottery, industrial ceramics & electronics etc. etc. The traditional skills under this industry distinct to certain states which have also earned worldwide popularity are - Black Pottery with inlaid silvery designs of Nizamabad, Blue Pottery of Jaipur, Rajasthan, Bankura Horses of West Bengal, Cooking Pots of Khanapur and Belgaum, Karnataka, Chilam and Hookka of Gujarat, Kashmir Glazed Pottery of Srinagar, J & K, Moghalian Glazed Pots & pans of Meerut, UP, simple Glazed Pottery of Tamil Nadu etc. An indepth study of this industry will bring to lime light various issues.

Present Study on Potters & Pottery Industry in South Tamil Nadu

The objectives of the study are

1. to assess the current economic position of the potters
2. To identify the problem faced by the potters
3. To investigate the future of the pottery industry
4. To offer suggestions for the development of the pottery Industry

The study is emperical based on survey method. In this survey, primary data were collected from the potters of 8 southern district of Tamil Nadu, i.e. Kanyakumari, Nellai Kattabomman, Chidambaranar, Kamarajar, Ramanathapuram, Pasum-

pon Thevar Thirumugan, Madurai & Dindigul Anna Dist., through personal interview with the help of structured interview schedule prepared for the purpose. According to the concentration of potters 1 to 3 respondents from each block of the district were interviewed. The secondary data were collected from panchayat unions, T.N.K. & V.I.B. and from Government Reports, journals and other KVIC publications. The details about production processes will be explained in the presentation.

Findings-problems and Suggestions

A sub caste known as velar, kumarar and kusavar is doing pottery work. The woman's participation in pottery industry in the region is significant and it is 43%, which is 3% more than the National average. The women assist male workers in all the processes of pottery making except throwing on wheel and they also participate in the marketing of pottery goods. Children who are below fourteen years are also engaged in pottery industry and it is 12.3%. It was observed that the following factors affect directly or indirectly the livelihood and performance of potters.

1. Illiteracy
2. Accommodation
3. Large sized family
4. Living condition and
5. Indebtedness

For the revival of pottery industry, Institutional support is required for pottery industries i.e. finance, market, training, research and servicing. The development of pottery industry should be closely linked to the Government programmes for Rural Development like IRDP, RLGP etc.,

Since the development of village pottery Industry is a complex exercise it is necessary that a co-ordinated approach involving Government, credit institutions, voluntary organisations, K.V.I.C, State KVIC Boards and other related Government should be evolved.

Kulalar Samudayam Munneradadharku Kaaranam Enna? Why the Potters Community has not Improved?

M.Thiagarajan

T.N.Potters Federation, No.70, Kandasamy Koil St. Madras 600 012

The reasons for the decline of potters community are cited here.

Included as Paper No.5 in the Tamil Section.

Kulalar Kalangal - Potters Vessels*N. Periaswamy**No.1, Kadambarkovilstreet, Kulithalai 639 104*

The method of making of vessels by Potters are described in this paper. This paper also describes about their divine skills.

Included as Paper No.6 in the Tamil Section.

Kulalar Samudayamum Thozhilum - Potters and Pottery*P.k. Muthuswamy**16, Kavi Bharathi Street, Shastri Nagar, Erode 638 002*

The history of Potters community and the pottery work are explained in this paper.

Included as Paper No.7 in the Tamil Section.

Kalimann - Clay and its speciality*K.K. Palanichamy**178, Shastri Nagar, Erode 638 002*

From the collection of clay till the making of Pots out of clay are described in this paper.

Included as Paper No.8 in the Pottery Section.

Karigiri Ornamental Pottery*Mr.K. Thambiran**Dept. of Ceramic Technology, No.59, Kandaswamy Koil StreetKosapet, Madras 600 012*

The Karigiri is the village about 6 km from the Katpadi Railway Station in Kudyatham Tk. North Arcot District in the railway route between Bangalore and Madras. Nearly 20 years back, about 20 potter families manufactured the glazed pottery ware and in 1980-81 only 7 families were making the Karigiri glazed pottery ware. The typical articles produced are various sizes of table flower vases, wall flower vases, magic gujas, ornamental ash-trays, graded flower pots of different shapes and sizes. Table ornamental ware and domestic ware articles including tea Cups and saucers are also produced. Red clay water kujas, water pot etc., with ornamental decorative motifs around is a speciality in Karigiri ware. At present only

one person was making the above. Traditional designs and motifs were produced by the skilled potter.

The articles manufactured by them should be sponsored by handicrafts Department and marketed. Glassed artware items should be sold through the artware show room of Victoria Technical Institute and various artware sales Emporium as Poompuhar in Madras City, Vellore, Coimbatore, Salem, Madurai, Kerala, Pondicherry and Bangalore and Hyderabad. First quality article selected pieces are to be sent to New Delhi, Bombay, Calcutta, against orders. Process of manufacture of these pots is given in the detailed paper. For some more information, the ceramic ware showroom in the author's residence may be visited.

Pottery Industry in Goa : A Comparative Analysis of Traditional Pottery and Modern Pottery

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Introduction

Goa is famous for two types of industries namely pottery and lime. Goan pottery is renowned considerably. More than 3000 families work in this industry. Pottery making is a traditional activity and is mainly related to a particular community. In Goa, pottery clusters are in Bicholim, mandre, madgaon, zambavali, verna, bardez, volpoi and other nearby places. The traditional pottery making is a household industry in Goa. Pottery making is more of a seasonal activity and an additional source of income to these families. However, very few industrial units at factory level are manufacturing modern artistic pottery.

The speciality of product mix of pottery in Goa is making Ganesh idols. Goa being famous for celebration of Ganesh Chaturdi by every hindu family with tradition geity and fervour, demand for Ganesh idols is very high. On an average 40,000 idols are in demand every year. This creates four months work to potters.

Pottery market is also full of utility items which are required for various uses in and around a residential quarters.

Types of Pottery Industries

There are two basic and important types of pottery units in Goa. One is traditional utility oriented units and the other is modern artistic studio oriented units. Basically, these traditional utility oriented units are household units. Modern pottery is associ-

ated with artistic value. Traditional household art of pottery is dyeing. They are not getting remunerative prices for their products. Aluminium, steel and plastic items have made inroads as potential alternatives to earthen wares. Therefore, naturally, demand for traditional pots is declining.

In the case of artistic pottery, all the inputs are not locally available. For potters in Goa, inputs like clay, cobalt, plaster of paris and other chemicals have to be procured from outside the state. For example, some type of clay is generally purchased from Saurashtra in Gujarat.

Conclusions

No new generation from the traditional families is entering into this field. So, family skills or art is declining. There is no improvement in the standard of living of the traditional potters of the older generation. The new generation of potters are reluctant to continue the profession. They go in search of jobs in other fields like Government Departments.

Yet there has sprung up a new group of pottery producing Goans. They are members of a new generation of Goans who have qualified and acquired modern techniques of art in pottery. They enter into the pottery industry. They find it as a lucrative industrial opportunity to use their talent and earn. As a result, modern artistic studio pottery has become a growing and flourishing industry. But it was observed that lack of technical knowledge, transportation and scarcity of inputs are the main problems faced by these entrepreneurs.

Pot-8 'Queen' Coal Fired Pottery Kiln - Reviver of Pottery Industries

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In past, the rural people were depending upon the village potters for various earthen wares to maintain their daily life. Today the community is most economically backward as the changing traditions have jeopardised the livelihood like other craftsmen of rural India. The major raw materials of the potter is firewood besides clay. Once the fire wood was gathered free of cost for baking (sintering) the potteries, but now, the potter is forced to buy. The escalating cost of firewood has virtually forced a potter to close down the industry as the process is highly uneconomical at present. Therefore many terracotta based industries, in individual and co-operative levels, which are producing country roof tiles, Mangalore pattern tiles, various domestic earthen wares are closed due to fire wood crises.

It is found from a survey conducted in Orissa that the potters consume about 1200 gm of firewood for sintering 1.0 kg. of thin section potteries like earthen pots, and 2 to 3 kg. of firewood in case of roof tiles in their traditional kilns. The potteries are sintered at low temperature about 600 C, resulting in poor strength and less life. As the temperature gradient in the traditional kilns is extremely uneven, the quality of the potteries is not uniform and 10 to 20% of potteries are being rejected in every firing due to over and under heating, breakage etc. The traditional kilns also pollute the environment as it creates a lot of smoke during firing. More over the traditional kilns are constructed and broken in every firing for loading the green pottery and unloading the sintered pottery respectively, which escalate the labour cost further. Still a few village potters

have kept the village industry alive around forest areas in the country inspite of enormous problems.

In this context Regional Research Laboratory (CSIR), Bhubaneswar has developed a low cost pottery kiln named as *Queen* kiln to bake various types of potteries, such as domestic earthen wares, handicrafts, roof tiles, floor tiles etc. of different thickness by use of low grade raw coal in place of fire wood. It is a down draft horizontal kiln with chimney. The kiln is constructed out of ordinary red bricks with clay and sand motor which is a permanent structure. The potteries are loaded and unloaded in the kiln through a door, like any industrial furnaces, which cuts down the labour drastically. A uniform temperature about 800 C - 900 C is maintained through out the kiln during firing for which the breakage of the potteries becomes virtually nil. Strength of the potteries are more as it is sintered at high temperature resulting in long life of the potteries. The firing period including preheating is about 7 to 12 hours depending upon the moisture in the potteries and quantity of the load, where as it is about 2 days in case of Traditional Biomass kilns. The coal consumption is 125 gm.

to 175 g. (F-grade coal) for sintering of 1.0 kg. of pottery. The potteries are bright red, durable and high strength. The pollution is substantially low as the coal is burnt fully in the furnace. In a nutshell, the 'Queen' kiln eliminates the use of firewood by low grade raw coal, saves 60% of energy as well as firing period and labour cost over the traditional pottery kilns. Above all it reduces 50% of production cost of potteries and conserves forest.

Queen kilns are in operation in Orissa and West Bengal since last two years. Many tile Industries are revived and felling of trees are virtually stopped by them. Presently the *Queen* kilns are available with baking volumes of 2.5 M (400 mangalore tiles) to 12 M³ (2200 mangalore tiles) and its construction cost ranges from Rs.6000/- to Rs.18,000/- in rural areas. Government agencies and banks are financing the potters for installation of the kilns. The average life of the kiln is 5 to 10 years depending upon the maintenance.

The full paper will describe the technical aspects of the kiln.

Pot-9

Modern Directions to - Rural Indian Pottery

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Pottery is a craft the human mind has brought out since civilization when man ended the nomadic life and started cultivation of land for survival. It is at that time many civilizations - groups of beings - survived on the banks of rivers. It is during this period the evolution of pots to store necessities came up. Indian Origin leads us to *Kumbhars* who used clay settled on the banks of Rivers to make vessels of such storage, for daily use of water as well as food. It is also said that the sage Vishwamitra brought out a *kalasa* to store water out of clay. Rigveda the oldest of all vedas mentions of pottery as early as 2000-3000 BC. Excavations of Indus-Valley, Mohan-

jedaro and Harappa indicates that Indian Pottery travelled to Mesopotamia, Egypt and Babylon as far back as 3000 BC. Decorative pottery came along with Muslim rulers about 1000 AD. Azamgarh, Nizamabad, and Chinar in U.P., Karigiri in South Arcot in Tamil Nadu, Khurja in Delhi still exist with Persian descendants.

The process of making clay starts with washing of clays, kneading of wet clay, throwing on a stone wheel, drying and firing. These processes of pot making will be presented during the presentation.

Pot-10

Potters and Potteries in Orissa

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Orissa popularly known as Kalinga is rich with many cultural and traditional heritages. With long stretching coastal belt, thousand and thousand hectares of forests and vast mineral resources, this State is glorified with multi-lingual inhabitants through different castes and creeds. As per 1991 census, the total population of the State is 3,16,59,736 out of which nearly 16% i.e. 51,29,332 belongs to scheduled caste and 22% i.e. 70,32,352 belongs to scheduled Tribe communities. With identified as literates and the rest of the population due socio-economic factors, are still striving hard to be literates.

It is no doubt a fact that Orissa is rapidly progressing in the field of agriculture, industrial set up, health, education through total literacy campaign and things like that. But inspite of such spectacular progress, the rural folk are still in the habit of adopting their own traditional works till date. For example, potters, Black smiths and weavers are still continuing their own profession even if their earnings are too meagre. The reason behind such continuation is due to their belief that such professions are still having some ethical values. If we focus our attention on the potters and potteries in Orissa, it is noticed that approximately 5% of the total population of the state are

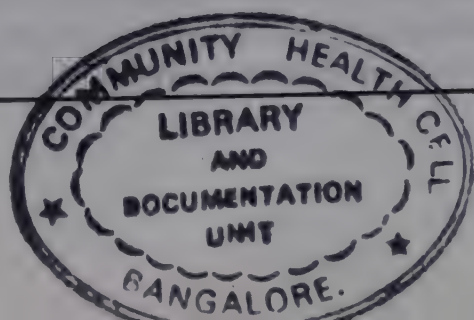
belonging to potter communities who are living in different places to spreading in 314 Blocks. In a recent survey conducted in that regard, it is revealed that about 0.5% of the potters have come up above to the poverty line. But the rest are still earning their livelihood by following the same classical procedure like their forefathers as indicated below

Wheel made up of wood of special type of clay collected from riverside, fire wood from local forest and above all total participation of the entire family members during the work period in preparing earthen vessels, pots, tiles toys and etc are the basic norm in the pottery work. This paper would give a detailed description about the finance, marketing, etc.

Textiles

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For Textile s Working Group, PPST Foundation

Our *Cotton route* began during the preparations for the Textile section of the first Traditional Sciences Congress. It dawned on us that the links between the cultivation of cotton and its technology and processing from fibre to yarn to cloth were not being given due weight when considering the problems of hand weaving and cloth making today. We have contacted the cotton research establishment (which has been most helpful in giving us information and seeds of desi varieties), academics and farmers, and our exploration into the connections between the plant, the tools and the product continue.

Our questions are: Why have state-sponsored shifts in cotton cultivation patterns led to ecological devastation through chemical poisoning and driven cultivators to suicide?

Why is cotton research in India conforming itself to the needs of the mills?

Why is it that handloom weavers do not get yarn, and how is this question connected with cotton policy?

Until about thirty years ago, cotton in India was mostly a rain-fed crop. Traditionally it was grown along with dal and other food crops, reducing pest damage and spreading the farmers risk.

Desi cotton is peculiarly adapted to rainable Indian weather conditions, and may yield less or more in bad or good weather conditions, but won't fail completely like the American, which must have a long succession of sunny days for a good yield. Desis are hardier, more resistant to pest, fungus and disease qualities that are enhanced by traditional dryland agricultural practices.

There is an immense variety of regional types - cotton adapts easily either by mutation or cross breeding - and desi varieties have adapted to every soil and every local climate in the country including the heavy rainfall areas in Assam and the North East. There are naturally coloured varieties like the creamy yellow cotton of the North East, and the light earthen pink *yerra pathi* of east godavari. There are varieties that are spun into the finest yarns, and plenty of local varieties suited to the special weaves and textures of each region.

At the time of Independence, 40% of the cotton growing area went to Pakistan while 90% of the users, both handlooms and textile mills, were on the Indian side. It was a serious headache for both countries, with Pakistan having to find immediate buyers for its standing crop and India, material for its textile industry. The Indian problem was temporarily solved by imports, but the direction of the officially managed research establishment was oriented specifically to the needs of the mills and for export. As the supply position of long linked superior cotton in the country was precarious and they were keenly in demand by the textile mills, the work of the sub-stations was geared to the evolution of long-linked varieties of American cotton. The propagation of American varieties went hand-in-hand with the building of the big dams, bringing cheap water to previously unirrigated land and the spread of chemical fertilizers and pesticides.

To grow American cotton, the farmer needs irrigation. Hirsutum varieties respond to irrigation and fertilizer, while desi is not so responsive, the yields being much the same with or without. With irrigation, insects have a field day and become gradually immune to chemical pesticides. Chemical fertilizers improve the yield but increase soil salinity and leach out soil nutrients, so that each successive year more and more chemical fertilizer has to be applied. Altogether, the enterprise entails high risks and is unsuited to small and marginal farmers who are attracted by the chance of high returns but unable to bear the high costs of failure.

Today, cotton is the world's main non-food crop, providing half of all the world's textiles. In 1992 the world's production was about 20 billion kg of which India produced more than 2 billion. India is one of the six largest cotton producing countries in the world, the others being the U.S.A., the former USSR, China, Brazil and Pakistan. These six with Turkey, Egypt, Mexico the Sudan grow 85% of the world's commercial production. India is the only country to grow all the varieties, also the only one with a sizeable handloom industry. Today in spite of the fact that India's production of cotton is 125 lakh bales (2.250 billion kg) the yarn starvation of the handloom industry, begun in colonial times, is worse than ever before.

Tex-2

Indigenous Cotton: Historical Neglect, Possibilities for Research and its role in the Identity of the Handloom Industry

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The question of the viability of handlooms in today's context has been challenged by the proponents of protection for the handloom sector largely on the basis of the significant employ-

ment potential that the sector has and continues to offer to large numbers of people (next only to agriculture). This line of thinking has influenced the state to introduce legislations that

have provided protection to this sector from severe competition from the mill and powerloom sectors. The regulations, however, have remained only on paper. Large scale violation of these legislations have occurred on the field owing to continued inaction by the state. The moral legitimacy for the offenders has been provided by the way handloom weaving has come to be seen in recent times—a sector with *inferior* and *obsolete* technologies that would have been anachronistic but for the fact that the sector constitutes a large voter base. This view needs to be contested and has unfortunately not received sufficient attention by the votaries of handlooms.

It is increasingly clear that a long term solution to the problems facing the indigenous textile industry must base itself on an identity that stays clear of the narrowly defined norms prevalent in its modern counterpart like productivity and efficiency. A vision for the industry has to recognize the strong linkages that existed between the various stages of cloth manufacture which gave Indian textiles that unique advantage in making it a world leader. For a revival of the industry one needs to appreciate that the weaver is important. It is the fading of these linkages in his daily life with the cotton growers, spinners, and dyers that makes him and others perceive his occupation as technologically inferior. This paper focuses its attention on one such linkage in cloth manufacture, namely, cotton growing, and traces its evolution in modern history.

Researches in economic history and the *deindustrialization* of India have shown that the supremacy of mechanized production of the industrial *revolution* was based on protective policies rather than on any technical advantages. There is a striking parallel in the case of cotton growing and in the preference of American varieties of cotton to the indigenous varieties. A critical look into the history of the cotton trade during colonial India shows that the demand for long staple cotton for the mills of Lancashire and Manchester was instrumental in changing cropping patterns in Britain's colonies. Britain's search for other sources of long staple cotton started in the wake of the disturbances in America, its principal source in the 18th century. Indian cloth manufacture was not based on long staple cotton which was the basis for all textile mills in the world. Over the years staple length became the main consideration of quality of cotton. Historically quality had diverse parameters like fibre durability, lustre, strength and absorbency. However the demands of the modern textile industry reduced it to one of ginning out-turn, staple length and spinnability.

Systematic attempts were made by the Imperial government to introduce American varieties to Indian farmers throughout the nineteenth century. These varieties, were, however unable to strike roots in the Indian soil and performed poorly in comparison to their Indian counterparts. It was only after repeated trials and provision of enhanced inputs by the state that these varie-

ties found acceptance. The story of American varieties versus the Indian varieties has since been one of intensive work and selective targeting of one species, in irrigated areas with high inputs of fertilizers and pesticides, to a continued neglect of the other. It is primarily as a result of this that the tables have turned the American way today. This has however not solved the problem for the farmer. On the other hand, it has made cotton a high risk crop. Cotton today is grown with deleterious effect to the soil and the environment (cotton that covers 5% of total cropped area of the country requires a staggering 55% of the pesticides consumed in India). Though self sufficiency in long staple cotton has been achieved in India since independence, it has served only the interests of the traders and the mill sector.

There has been little research done on the above aspects and the available material is sketchy and in parts. The present paper hopes to provide a historical continuity to the developments in the cotton textile industry. It is evident from the study that the evolution of textile industry and the changing methods of cloth production, from handlooms to mills, are linked to the dynamics of cotton growing in terms of the cropping pattern and changes in variety. It is evident from the historical narrative that the choice towards a more productive crop and a better technology was not one of a natural evolution of technology from a primitive to a more advanced form but arose out of very specific historical conditions.

The aim of the present paper is not to peg the debate on varieties on a narrow plane of the technological superiority of the American or the Indian but to highlight the distortions in the research priorities of the Imperial government and the research laboratories since independence. If a choice were to be made today for the kind of technology that would be best suited for large sections of society, that serves the interests of the producer, the weaver and the soil, there is every reason for the promotion of indigenous varieties. Comprehensive research into indigenous varieties of cotton that could provide a crucial link in establishing the axioms of a textile industry on parameters that highlight its natural advantages. Such a study will have to look into the evolution of textile machinery and could provide the basis of a new line of machines more suited to present varieties of cotton and decentralized spinning. There is a need for a new thinking for research and development in the textile sector. The paper attempts to provide the contours of such a study that will focus on a closer integration of its constituent parts rather than the universal dictums of productivity.

For the purposes of the study the paper draws extensively on the findings of the Textiles Working Group, studies on economic history and documents on the resuscitation of the textile industry initiated by Gandhi during the freedom movement.

Traditional and Indigenous Innovative Farmers' Practices for Cotton Cultivation in Northern India

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Cotton is the most important commercial cash crop of the kharif season in India. Lot of efforts have been made to maximize its yield potential by evolving high yielding, location specific varieties, multidisciplinary system approaches and pest management practices. Helico verpa armigera (Hb) has been identified as one of the major constraints in crop production in the northern belt of the country. Continuous and frequent use of chemical pesticides results in environmental pollution, insect resistance, insect resurgence, residue problems and other hazards. Moreover, continuous use and over doses of these pesticides also results in the disruption of the ecosystem.

Various traditional and indigenous innovative farmers practices are prevalent with regard to cotton cultivation and management practices in various parts of India. These technologies still hold good in terms of their relevance vis a vis the latest improved scientific farm practices and management viz., soil type, optimum seed rate and spacing, seed treatment, interculture operation and weed control, crop rotation, integrated pest and disease management, etc. These have been proved scientifically effective, through experimentation at various places, and are being used by most of the farmers especially in the northern cotton belt in Haryana, Punjab, Rajasthan and Gujarat. Being age old, these traditional farm practices are based on the rich experience of cotton growers and have been imbibed by farmers from generation to generation from their ancestors. This knowledge is mostly available in the form of verbal and written proverbs, couplets, idioms, folk tales, etc., which is simple to understand and easy to adopt. An example of the best suited soil type for cotton crop is elaborated in one of the ancient proverbs as given below:

Jo Kanta Tere Dhan Ghana, Gari Karle Do,

Jo Tere Dhan Nahin, Kalar Bari Bo.

A farmer's wife advises her husband: If you have more money, then purchase one more bullock-cart and if you have no money, then cultivate cotton in black type of soil and you will become rich.

Likewise, other scientific based farm practices related to cotton cultivation for different management practices are also prevalent. These include germination through seed treatment, cutting off top branches in case of excessive growth and control of insect pests and diseases by the use of neem and tobacco based plant extracts available locally. The recent studies on pest control have revealed that the organo phosphorus pesticides and synthetic pyrethroids should be used alternately during the reproductive phase of the crop.

Furthermore, the concept of economic threshold, i.e. the level of pest population at which the control measure should be adopted so that the population does not reach the economic injury level, is an important component of Integrated Pest Management which teaches us to live with insects.

The inclusion, incorporation and coordination of these farm practices with the available scientific present day knowledge of cotton cultivation will further improve the methodology for better transfer of cotton cultivation technologies in simple and better ways to grassroot levels and the ultimate user of these technologies, the farmer. Detailed documentation and scientific experimentation on these farm practices will further prove their identity and authenticity.

New Trends and Challenges in Cotton

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Several developmental changes, rapid modernization in textile industry, changed consumer preferences for ecofriendly cotton and call for sustainable agriculture demand a dynamic rethinking on several of our conventional approaches to cotton research, production methods and processing.

In the changed global and national cotton scenario, farmer oriented research is essential to narrow down the technological gap and to meet the challenge of balancing between increasing the productivity and profitability as well as sustaining the essential resources and other aspects of the environment.

Industry oriented research, especially genetic improvements and production technologies, needs several new aspects to be considered especially in fibre characteristics. The adoption of new spinning methods, certain advances in traditional spinning processes and new consumer demands call for extensive research and genetic improvement of the raw material. Unlike synthetic fibres, cotton fibres cannot be improved during processing beyond a certain narrow limit and the real progress can be achieved through breeding. Production practices including harvesting and ginning also contribute to the preservation of quality gained through genetic improvement.

Though there is a new craze for naturally coloured linted cotton, coloured cottons are as old as the normal commercial white linted cottons. Most of the wild species themselves bear coloured lint though non-spinnable. In the earlier times, certain coloured types used to be grown for home consumption and hand spinning on a limited scale, but kept out of commercially cultivated kept the coloured cotton out of significant cultivation because of its potential threat to the purity maintenance of white linted commercial varieties.

Cotton is one of the highest consuming crops of fertilizer and pesticides. High chemical input cost in total cost of production and the impact of such large scale use of chemical fertilisers and pesticide on environment have caused concerns at world levels. Inorganic fertilizer use and pesticidal use have been

reported to cause degradation of soil properties, adverse effects on favourable microflora and natural beneficial insects acting as parasites and predators of insect pests, ecological and environmental pollution. Globally there is a strong opinion in favour of reduced use of pesticides and fertilizers to minimise the impact of environmental contamination of agricultural ecosystems, water supplies, food, animals and man and organic production is being suggested as an alternative acceptable for all countries.

Organic cotton production will be influenced by pest and disease problems, low production potential of the varieties, higher production cost and low fibre quality. In India some of the Asiatic cotton growing areas are Gujarat, Maharashtra, certain tribal areas of Madhya Pradesh, NEH region etc.

Tex-5 **Appropriate Technology for Khadi and Handloom Industry**

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This paper deals with the suitability of some modern technologies for adoption in the Khadi and Handloom Industry. It also reveals some of the developments done by the Department of Textile Technology, PSG Polytechnic, Coimbatore, their suitability to Khadi and Handloom Industry and their advantages over the existing systems. In yarn formation, rotor spinning technique may be exploited satisfactorily for spinning coarser yarns of counts upto 40 Ne. The friction spinning technique may be potentially significant in Khadi Spinning, if the system is miniaturised and suitably modified. The self-twist spinning technique can become a leading technique to spin wool fibres in future. The technique of producing cover spun yarns may be developed to produce yarns in Khadi industry in a wide range of colours. In future, novelty and speciality yarns may take a considerable portion of Khadi yarn production.

In fabric formation, several neglected and forgotten conventional techniques like knitting, braiding, lacing and embroidering may be revived to add a new range of products in Khadi industry. The incorporation of computer aided textile designing systems into the fabric designing process will enhance the Khadi industry to meet the competition from mill sector. The use of the fan shaped reed to manufacture fancy effect fabrics which is a forgotten old technique can be revived to produce a

variety of fancy fabrics in Khadi industry. Hand knitting technology can enable Khadi industry to produce fabrics ranging from hosiery, underwear, sweater, slacks, suits and coats, to rugs and other home furnishings. The Centre for Development of Rural Technology (CDRT) of Department of Textile Technology, PSG Polytechnic has developed several modern equipments for the use of Khadi and Handloom industry as:

- Portable hand operated pilm winder
- Continuous sizing for handloom
- Computer aided textile designing
- Pedal operated rotor spinning machine
- Solar cocoon stifling equipment
- Hand operated cheese winder
- Auto silk reeling machine
- Hank mercerising machine
- Pedal operated cheese winder
- Pedal operated pilm winder.

These equipments find a wide application in handloom industry and possess several advantages over the existing equipments.

Tex-6 **Theme Paper on Natural Dyes and Dyeing**

L. Kannan

for Textiles Working Group, PPST Foundation

Widespread awareness of health hazards of chemical colours and increasing stringent environmental regulations have hastened the search for safe alternatives. The rich and diverse

traditions of natural dyeing in India hold much promise in this context. The recent ban on azo-based dyes by Germany has provided a further fillip to the flurry of activity in this direction.

Ironically, the enthusiasm for the "gold rush" offered by global demand for eco-friendly products may in fact hasten the destruction of the resource base.

Commercial viability is no doubt important for the promotion of any activity. However, it is necessary to understand and temper the dynamics of the processes of commercialisation with a sensitivity to the environmental and social ramifications of such a change.

It also needs to be borne in mind that natural dyeing is not just a different way of dyeing but opens up the possibility of qualitatively reorganising our modes of production. It would be a folly to overlook these possibilities in merely trying to substitute a naturally derived extract in place of a synthetic dye-stuff. Such an attempt is also likely to be technically unsound, reinforcing the misconception that natural dyes are unsuited to meet the requirements and large volumes of production.

In trying to come to grips with these issues, several important questions come to our mind. Finding answers to these may show us the direction for the future:

Technical Questions

- a) What are the range of requirements that natural dyes can meet, with regard to range of colours, fastness, brightness, applicability on various media etc?
- b) Can there be standardisation of natural colours? If yes, how do we go about it? If not, what is our position with respect to this?
- c) Is it possible to have a system of quality certification-for raw materials and finished goods-that ensures that i) natural dyed products conform to desired quality specification, and ii) synthetically dyed products are not passed-off as naturally-dyed.
- d) What are the major directions demanding attention from researchers?

Questions on Promotional Initiatives

Promotion of natural dyes needs to take place with an appreciation of the following two points.

Tex-7 A Historical Study on Traditional Technology and Forgotten Knowledge on Indigo and its Processing: Reconstructed from European Records, 1500-1870

S. Jeyaseela Stephen

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The area around Pondicherry and Cuddalore in the South Arcot region in modern Tamilnadu was known for its production of indigo and also famous for its manufacture of blue cloth during the age of European expansion between 1500 and 1800. The Portuguese were the first to settle down at the port

a) Natural dyes are not to remain as items of curiosity or cater to just the upper-end of the market, but form a substantial alternative to synthetic dyes-both in terms of quality and quantity.

b) While the export market seems to provide a strong commercial incentive for the growth of natural dyes, it is essentially an unstable phenomenon.

To establish natural dyeing on a sound footing in the long run, efforts should be made to capture a wide segment of the domestic market.

Such an understanding immediately opens up a number of complex questions to be addressed:

- a) How should production be organised to meet this challenge, in terms of scale, nature of technology etc.,?
- b) What are the marketing structures best suited to reaching a wide market, while maintaining quality and regional specialisation?
- c) Is the raw-material availability adequate to meet such a vast requirement? If not, what are the steps needed to widen the resource-base?
- d) Is adequately skilled manpower available? What is the training infrastructure necessary?
- e) How can small and independent units be provided with research support to suit their local requirements and maintain quality control?

Social and Ecological Aspects

- a) What are the checks and balances necessary to ensure that the natural dyeing industry grows sustainably, without depletion of natural resources and erosion of bio-diversity?
- b) How is it to be ensured that increasing commercial interest in the natural resource-base does not deprive traditional communities of access to Common Property Resources?
- c) What is the system to recognise the Intellectual Property Rights of communities who have preserved and innovated upon traditional techniques of natural dyeing?

of Devanampattinam (Modern port of Cuddalore) with the permission of the Nayaka of Gingee in 1580. The king of Portugal had appointed a Portuguese captain namely Damiao Paes and he purchased rice, textiles, saltpetre and Indigo available in the hinterland and exported it. The availability of Indigo

attracted the Dutch to settle down in the same place driving the Portuguese away by seeking the permission of the Nayaka ruler of Gingee in 1610. The indigo from Cuddalore was better quality than the from Masulipatnam, though even the former was not free from impurities mixed with sand had been mentioned in a letter written by a Dutch official from Tirupapuliur on 22nd November 1617. Indigo was available at Thirupapuliur against cash at rials per bahar. The buying of indigo had been generally explored by the Dutch in the month of April. It had been also discovered that if the contracts were given out as early as in January about 50 bahars of indigo could be easily collected by the middle of June.

Pondicherry was another place where indigo was available and the French at Pondicherry bought it at 120 pardaus per bahar mainly from the local nayak. The French exchanged mainly lead to purchase indigo. They also refused to buy more bahars of indigo till such time the Nayak agreed to buy from them 12 bahars of ivory. Indigo available in the hinterland of Pondicherry appears to have entered into the market of Pondicherry and it had been exempted from the payment of tax called *magamai* in the later periods particularly between 1776 to 1789.

The cultivation of Indigo developed well under the patronage extended by the English who built Fort St. David at Cuddalore. All these European trading companies that happened to see the cultivation of Indigo and its processing besides textile dyeing of indigo were struck with wonder to see how Indigo was undergoing several processes. They attempted to describe the native methods that had been adopted by the Tamils.

In the absence of scientific study on Indigo and its processing based on historical records there was a need felt for this particular study on traditional technology and the present paper enquires into the permanence or discontinuity of traditions in Tamil country more precisely starting from research in the archives to field work investigations. The reading of the texts of the documents of the past could be compared with the present day existing practice in order to assess their relevance when applied to the context of continuous or discontinuous models of tradition, more particularly to establish invented traditions.

The use of indigo (*Averi*) in Tamil Nadu is not difficult to determine. It was a common vegetable dye and the cloth dyed with Indigo had been referred to *asnila kachai* in *Purananauru* in the ancient period.

According to French records *averei* or indigo was the Acacia tree and the seed was light brown or olive green in colour. It has been well dried and reduced to powder in Pondicherry. The powder was placed in a big vessel full of water allowed to run through a small hole in the bottom of the vessel where the Indigo, in a large earthen vessel full of cold water, by adding a proportionate quantity of lime, similarly reduced to powder. Indigo was then smelled by the individual to detect sourness and in that sufficient lime was added until the odour was lost. Then taking about a quarter of a bushel of *averei* seeds the artisan let them boil in a pil of water for a day and a night ensuring that the cauldron was always full of water. Then he poured the whole water and seed into the vessel of prepared indigo. This dye was then left for three days but care was taken to mix it up four or five times a day with a stick. If the indigo had inclined to smell sour a certain amount of lime was added. This observation was made at Pondicherry during the fourth decade of the eighteenth century. As *Indigofera Tinctoria* did not dissolve in water but required an alkaline vat subsequent oxidation was necessary to yield its blue colour, this method practised in Pondicherry was compared with other blue dyes such as woad (*Isatis tinctoria*) grown in Europe.

As per the English records we have the account of Thomas Parry who came from Madras to Cuddalore in 1807, and witnessed the process of manufacture of indigo and did much to improve it. He learnt that the indigo at Cuddalore was much more superior in grain. Indigo manufactured at Cuddalore had been belonging principally to Thomas Parry and his partner Mr. Pugh. However he hoped to get more information from his friend Mr. A. Colvin residing in Calcutta, as there was no one to whom he could apply so capable of giving him advice and assistance in this matter. He also planned to make some comparative study of the indigo processing in Bengal and raised certain questions. Some examples may be cited here. The present paper also highlights the salient features and differences that existed in the manufacture and processing of indigo practised in North India and Cuddalore in this period.

Tex-8

Iyarkai Saya Muraigal - Natural Dyeing Techniques

Tamil Nadu Padmasaliyar Sangam

This paper documents some forgotten natural dyes and dyeing techniques from Thanjavur.

Included as paper no.9 in the Tamil Section.

What ails the art silk weaving tradition of Chinnalapatti? A Case Study

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Aim

The article investigates into the once famous art silk tradition called Chinnalapatti pattu (silk) with a view to understand the factors responsible for its decline. A critical analysis of the possibility of revival is done from the point of view of the weaver, traders and the consumers.

Historical Aspects

The once famous Chinnalapatti *art silk* owes its existence to the Devengar community with its artisanal tradition of weaving. The Devangars had their origin in Karnataka. It is said that Tipu Sultan brought a number of them to various locations in Tamil Nadu. Kannada is still spoken among these people. The Chinnalapatti township is situated 15 kms south of Tipu Sultan's fort in Dindigul.

The art silk at its peak

Some 45 years back about 2000 handlooms were busy in Chinnalapatti. Both cotton and art silk sarees were being produced. In a time span of 20 years the number of handlooms rose to 10,000 dully dedicated to the production of art silk. There was a daily out put of 50,000 meters of Chinnalapatti sarees (and an equal quantity in the villages around). In addition to art silk, dhooties and skirt materials were also being produced-though these were more from other art silk production centres. The sarees were sold throughout Tamil Nadu and in other parts of India. They were also exported to countries like Malaysia, Mauritius and Singapore.

Reasons for Decline

Around 1985 the going became tough for the weavers in Chinnalapatti. The chief reason was hike in the price of viscose yarn which was due to establishment and labour costs. The art silk yarns which was priced at Rs.25/kg in 1950 trebled to Rs.75-90/kg in 1985. The sarees which were sold at Rs.10/- per saree now could be had only for Rs.85-90. To steady the price of the sarees, the weavers had to compromise on lesser wages (almost half of what they got before). The situation was made worse by the

power loom sector and the tradition of master weavers. In fact, art silk produced in the power looms were 25% cheaper.

At the same time the market was being flooded with dozens of other synthetic and natural fabrics.

Once the consumer had only the cotton and Chinnalapatti saree to choose from. Today there are polyesters, voyil, chiffon, Belgaum silks, Kora silks, Sungudi sarees as alternatives to the customers.

The Chinnalapatti sarees have some inherent demerits too (as explained later). This also contributed to its decline.

This many sided attack resulted in a crisis for the weavers of Chinnalapatti. The looms slowly came to a standstill or started weaving other fabrics like cotton, polyester. About 50% of the weaving community migrated to Delhi where they were forced to take up menial jobs as servants, shop hands etc. Of the people who stayed back in Chinnalapatti about 50% took to other trades like furniture making. Today there are only about 3,000 looms dedicated to Kora sarees, Kerala dhothies and handloom and polyester sarees for Co-optex. In fact there is not a single loom where Chinnalapatti is woven.

Conclusions

The Chinnalapatti art-silk tradition arose up and bloomed as a trade. Now it is at its lowest-but not extinct. It has its traditional strongholds like certain communities patronising it-particularly the older women. It has also many new avenues-for example the art-silk robes preferred in African Muslim countries and also the use of art silk for dhothies and for use over temple deities. May be there are other new avenues still unexplored including exports to other regions on the globe.

But only an integrated look into the energy, technology, organisational aspects (like the master weaver concept) added with a consumer oriented novelties in design could help revive the tradition.

The case is typical of many similar trades facing similar forces of destabilisation.

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In Retrospect

The nationalisation of India's technological base on the one hand and, on the other, the administration of its varied population have been, since British times, two, entirely separate, projects. So much so that policies on hand woven cloth and its technology were never really conscious of the weaver communities, i.e. those who were the actual repositories of the skill and knowledge of weaving. Thus, at the beginning of this century, handloom weaving was the focus of attention only in so far as it enabled India to be transformed from an agricultural to an industrial society.

The Industrial Commission Report of 1918 advised on the establishment of rational, efficient organisations like factories, cooperatives and technical schools to facilitate India's industrialisation, but was silent on the role of weaving communities in this reformation. That India's industrialisation programme remained delinked from the Imperial government's understanding of India's caste based society is clear from their obsession with socio-religious aspects of caste. This latter obsession culminated in the first Ethnographic Survey of India initiated in 1855 by colonial ethnographers, C.J.Ibbetson, John C. Nesfield and H.H.Risley.

Government data on weaving communities primarily documents their rules of marriage and commensality, their religious beliefs and practices, their myths of origin etc. Data pertaining to their occupation, however, is limited to a description of the textiles produced largely from the point of view either of their significance in the world market or with respect to the survival of British rather than Indian weavers.

The early phase (1930's onwards) of anthropology in India too was influenced by these descriptive ethnographies and while the focus shifted to more holistic, micro-level studies of castes and tribes, the study of communities as work or profession oriented groupings continued to be subordinated to the study of kinship and religion. Simultaneously, the series of Technical Monographs brought out during this period (eg. on silk, cotton, dyes etc.) ignored the integral relationship between a community and its technology and skill base.

When, in the first quarter of this century, the member of the Saurashtra community requested for opportunities in technical education in weaving and dyeing, it was granted, but when they asked for a financial scheme for the economic benefits of their members, it was refused, on the ground that preferential treatment on the basis of caste was considered un-British.

This approach is evident in the contradictory identities attributed to artisan communities even today. The Indian government's commitment to economic growth presumes artisans to

be a mere techno-economic category of *skilled labour* occupying the margins of the overall economy.

Paradoxically, it is these very unnamed *craftspeople* who today are actively engaged in political representations on behalf of their *jatis* in negating their traditional caste status in favour of its modern avatar, the backward and most backward caste status. Sadly, none of these representations are concerned with their traditional occupation of handloom weaving.

Instead, a major function of weaver jati associations today is not to provide loans but to provide scholarships, books and other materials for the propagation of a minimum secondary school education for weavers' children. The general emphasis is clearly on a non-technical education which, in today's context, ensures a secure white collar job even if it be of the lowest rung.

The prospect: Some lessons from Kumbakonam

The fact of the divergence of policies relating to work and technology from those concerning caste, in both pre and post Independent India, however, has thus far not been entirely successful in abolishing, from India, the handicraft mode of production.

In Kumbakonam, silk weaving is not a matter of an individual's occupation, but the collective enterprise of cooperating households, streets and villages, whose unifying principle is a shared community identity. At the end of the last century, Kumbakonam had 2,500 weavers working on some 2,000 silk looms (Thurston 1899). Exactly a century later the total area of operation of the largest silk cooperative society in Thiribhuvanam alone covers approx. 10,000 looms!

A phenomenal growth considering the onslaught of mills and powerlooms in the handloom sector. What is even more surprising is that this growth has been unaided by technical schools and factory type production modes, so keenly recommended by the Industrial Commission Report of 1918.

Judging by the present scale of the silk handloom industry in Tamil Nadu, it is startling to learn that production continues to remain decentralised and household based. The weaver's home may be the productive unit cum training ground but the owners of large capital for purchase of *zari* and silk yarn in Kumbakonam are the large societies and silk merchants.

On an average, a silk merchant may have in his employ anywhere from 50 to 500 looms located in a number of surrounding villages. They provide advances and loans to weavers for weaving the warps into saris. These merchants in turn are members of credit societies that aid them in financing capital. There are also private and government bodies that provide wholesale raw silk on credit. In addition, these merchant manufacturers have links with retailers who promise to keep

their stock until sales are made following which alone these manufacturers may realise their initial capital alongwith some profit.

The emphasis is not so much on large profit margins as much as on large volumes and rapid sales turnovers, and small profit margins. But the questions we are addressing are: how are credit transactions on such a large scale made so effortlessly without the security of modern joint stock companies? and secondly, how do these merchants manage to employ hundreds of weavers working independently in their own homes without centralised supervision?

It is well known that the silk merchants in Kumbakonam are known for their honesty and quick repayment of loans in the market. They abide by a certain discipline and ethic of business transaction which is governed not by the pursuit of quick profits, but by the gradual building up of a steady business through enduring relationships. The Karnataka Silk Board apparently has not lost even a single pie in Kumbakonam unlike in Banaras where merchants have defaulted over lakhs of rupees.

The logic of low profit margins for a successful enterprise makes sense only if it is accompanied by large volumes. It is also possible if intermediaries are kept to the minimum. This is possible ideally when the manufacturer is also the retailer or when the relation between the two is not merely contractual but based on an implicit trust. And what relation is more secure and unconditional than that of kinship, marriage and community.

Not only do the prominent silk business houses of Madras today belong to the same community: Padmasaliyar, it is also a policy among them to expand their manufacturing and retail base only if there are people in the extended family who can do it. From the manufacturing to retail stages, the entire business is in the hands of relations by blood or marriage. Even the weaving households, atleast in the Kumbakonam area are largely of the same community.

Merchants strongly believe that community links strengthen the relationship of trust between them and their weavers so that weavers are less likely to default. From the weaver's point of view too merchants of their own community are relatively free with loans and advances and even engage in welfare activities through their community *sangam*. Often prominent business men in the silk industry are also office bearers of their community *sangam* and engage in concerted efforts of philanthropy for their community. It is no surprise that these very persons are also responsible for the successful wage negotiations between weaver's union and the silk merchants association.

The Kumbakonam case is only a beginning in our understanding of how a people's work and community life define one another. It is also a glimpse of how merchants too can be seen not merely as owners of capital for the sole purpose of making profit, but as *trustees* of their local community resource, namely, handlooms and their corresponding weaver's households.

Tex-12

Thozhil Valarchi Karuthugal Steps for the Betterment of the Handloom Weaving Profession

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Future of the handloom industry in India has not only depended upon the competition from the organised textile mills as well as unauthorised power looms in the decentralised sector. Similarly future of handloom industry (Weaving) depends upon specific characteristics of production and marketing relations. So the social status of the weaver should be guarded by giving more encouragement to the weaver to follow his profession which is providing employment to the millions of the people. Steps to be taken for the welfare of the weavers are

1. Subsidised hank yarn should be supplied to the weaver
2. Subsidised Zari and dyes should be supplied
3. As per Supreme Court judgement given on 5.2.93, 22 varieties and items should be given for handloom industry only and the Central and State governments should

strictly implement the scheme by taking strict action on the law breakers

4. Security measures for Weavers such as insurance scheme provident fund, old age pension schemes should be implemented
5. Food stuffs should be supplied at subsidised rates
6. Educational scholarship should be given to the children of the handloom community
7. Welfare measures should be extended to all weavers either they come under the cooperative fold or they are working with master weavers and lastly governments should extend its cooperation to weaving industry by clearing its stagnated production and facilities to purchase handloom cloth law should also be made to purchase few meters of handloom cloth every by every government employee for his family.

Agriculture & Live-stock Management

Livestock Sharing: Successful Traditional Village Enterprise

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Livestock sharing is an important village level traditional economic enterprise practiced by the farmers of Tamil Nadu. The livestock sharing ensures their livelihood in one form or other. Traditional practice of sharing the livestock among the farmers brings sustainability to the village economy along with the active participation of the people in the social and cultural spheres of the village life. The sharing of livestock establishes a symbiotic relationship among the farmers, both economically as well as socially. The sharing of work bullocks, bulls, milch cattle, sheep and goat are done in many ways according to the individual needs and types of livestock service shared. Some of the well established prevailing practices in livestock sharing in Tamil Nadu State are discussed here.

Milch Animal Sharing

In milch animal sharing an agreement is made between the owner and caretaker for rearing of the animal from calthood to adult animal. The moment the calf is weaned it is handed over

to the caretaker who takes care of the calf until it grows and becomes an adult animal. Until then it is the duty of the caretaker to look after the animal. Sometimes, the agreement is made upto the date of calving. In return, the caretaker gets a sum of Rs.200-250/- at the time of taking the calf for rearing and also an assured sum of one fourth to half of the prevailing market price for that cow along with its calf. The amount is normally given to the caretaker before he returns the animal to the owner. Any violation of the agreement is taken very seriously and is punishable by the village panchayat. In case for some reason the caretaker wants to keep the animal or the owner is not interested to take back his animal, the caretaker gives the compensation money to the owner.

If the animal dies accidentally during the period of agreement then one-half of the prevailing price of the animal is given to the owner. An agreement specifying all the terms and conditions is made in the beginning itself.

Draught-Animal Sharing

In villages, the draught animal sharing is widely practiced for performing various agricultural operations. At a certain time, the draught animals are shared along with agricultural implements and cart. In return of utilising the services the farmer gives back to the owner a portion of the fodder harvested from his field as feed to the animals. In some places the utiliser gives his services as manual labour by performing similar operations in the animal owner's field. This practice mainly helps the marginal and small farmers who lack adequate resources for investment in agriculture. The generation of resources required for agricultural operations are done within the sustainable limit of the farmer by utilising the surplus family labour available with him.

Sheep Penning and Kidai System

The cultural practice of keeping flock of sheep in the field overnight at the time of land preparation before sowing helps the farmer to meet the fertilizer requirement for his field. In the dryland areas of Tamil Nadu where agriculture still depends upon the monsoon, the farmer is highly dependent on this practice. To keep a block of sheep of 300-400 the cost of keeping them overnight in the field is Rs.200-250/- according to the demand. The sheep penner migrates his flock from one

place to other and stays at every place until penning is over in that village.

In some villages the sheep penning functions as a cooperative society and the whole activity is named as kidai system. Kidai is a village level cooperative enterprise in which the members of the system contribute in terms of sheep and goats to the kidai. One Kidai Unit is approximately kept as 100-200 herds of sheep and five to six such units form a single kidai. The members of this system get the service of flocking the sheep in their fields according to their contributions to kidai. In addition, the members of the system also contribute in terms of fodder and labour to the system. The return the kidai is in the form of organic manure to the member farms, sale of excess manure by offering sheep penning in non-member farms and sale of sheep and appreciation of value through new born kids. In addition to the supply of organic manure to the farmers, the kidai also ensures an additional income of Rs.1000-26000/- according to the contribution of the farmers to the kidai.

The sharing of livestock and services in the village is therefore, a traditional economic institution created to generate resources from within the system to minimise the external input, risk coverage through additional income generated and utilisation of local resources which ensures a sustainable agriculture.

Social Need for Conservation of Indigenous Livestock Breeds

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Introduction

The most common reasons cited for conservation of indigenous breeds of livestock are preservation of valuable genetic material and maintaining biodiversity. Genetic material may be preserved in-vivo or in vitro. In fact the same genetic material is being preserved not only in sites within the country but also abroad eg. Indian buffaloes in Australia & Brazil and the Brahman bull in America.

Looking back historically, livestock breeds have been selected and developed to fulfil specific production goals of specific regions, eg. sheep in the semi arid area of the Deccan for meat, wool & dung.

A common criticism of our indigenous production system is large numbers but low productivity. The National livestock policy in its opening statement reads. Livestock wealth of India needs redefinition - they are a wealth in terms of genetic diversity & germplasm but not in the economic sense.

However, the productivity as mentioned above has been defined by macro economic aspects and gives little recognition to the micro economic survival strategies of the rural poor who rear these animals.

A deeper look into where and how different specialized breeds of livestock have originated gives us an idea about why these

breeds have developed. To illustrate this we cite a few examples. These examples would be given in the detailed paper.

Summary

Farmers maintain livestock to meet local demands of dung, draft, milk, wool etc. These animals are often maintained on negligible external inputs because the natural resources in these regions are low & will not permit a more intensive form of animal rearing. Many traditional livelihoods, occupations and incomes have evolved around these livestock rearing practices e.g. traditional spinners, weavers of wool into blankets. By not paying attention to these local production processes not only will certain breeds disappear but certain traditional occupations will also disappear and without training these people may not be in a position to take up other professions. Many symbiotic relationships like those between shepherds and farmers will also disappear.

It is therefore crucial that development workers need to study local production processes & goals before designing & implementing livestock development programmes. Cross breeding & upgrading of so called low producing local breeds with exotic pure breeds and other high producing breeds may not achieve the true objectives of rural development. Instead efforts at improving overall nutritional & health status of local animal through region specific well designed programmes may serve the needs of society better.

Indigenous Vision of Curing Digestive Disorders In Bovines

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A study was undertaken to document the indigenous treatments to cure digestive disorders in bovines involving 300 rural families in Bareilly district of U.P. The medicinal properties of the common active ingredients used in the treatment were also studied which in turn would serve and act as feed forward to formal Research and Development Organisations so that research scientists can blend these active ingredients with the modern/synthetic ones to develop a more effective and relatively cheaper method of treatment which will be widely acceptable by many concerned. Probably such a study is a need of the time and worth probing. Amongst surveyed families, as many as 88 per cent were treating digestive disorders of their animals indigenously. They reported more than 40 different indigenous methods of treatment. About 40 per cent of the respondents had acquired indigenous knowledge from within the family and the remaining 60 per cent, from members of the

same village. Of 8,868 animals were actually treated by them, 7,521 were reported completely cured. On an average basis, 34 animals per family were treated and 28 animals were cured. As many as 85 per cent respondents perceived indigenous treatments as highly effective and others as effective. The expenditure incurred for treating digestive disorder indigenously worked out to be Rs.8.13 per respondents and Rs.0.24 per animal which is undoubtedly much cheaper.

The indigenous treatments which were widely used and had shown remarkable efficacy in curing digestive disorders in the opinion of rural families were as follows

1. Decoction of omum (*Trachyspermum ammi*), black cumin seeds (*Cuminum cyminum*), pepper (*Piper nigrum*), Harhar (*Gynandropsis Pentohyllay*), bahera (*Sesamum indian*) and black cardamom (*Elettaria Cardamomum*).

2. Feeding of ground green root of bajra (*Pennisetum typhoidium*).
3. Mixture of root of karthumbha, fenugreek (*Trigonella foenum*), omum, (*Trachyspermum ammi*), guarpatta and black pepper (*Piper nigrum*) for quick relief.
4. A paste of amarbel (*Cascuta reflexa*), mint (*Mentha spicata*) roots, peepal (*Ficus religiosa*) leaves, omum (*Trachyspermum ammi*) with salt, is given to animals suffering from digestive disorders.
5. A paste of dudhi (*Euphorbia microphylla*) and jalkumbhi is prepared and diluted in water to cure digestive disorder. The affected animal is also fed paste of dudhi grass alongwith jambun seeds (*Syzygium jambolanum*) for quick relief.
6. Feeding of a paste of jaiti grass and bitter gourd (*Momordica charantia*) and its leaves.
7. A paste of dudhi (*Euphorbia microphylla*) alongwith mustard oil is given.
8. To cure diarrhoea, roasted bael (*Aegle marmelas*) fruit along with water is given.
9. Mixture of shisham leaves, bengal gram flour (*Cicer arietinum*), barley flour along with salt is given.
10. Feeding of outer cover of grounded pomogranate after mixing in curd to cure diarrhoea.

It appears that the farmers with certain rationale used various ingredients while treating the ailments and their proven efficacy was found to be in consonance with the scientists perception and views. The medicinal properties of these ingredients further confirms its efficacy and right use. Ingredients like Harr. Omum, Jeera, Pepper mint leaves are stomachic, carminative stimulants, antispasmodic, lactagogue in nature and are often used in colic and flatulences. Mustard oil is laxative in nature. Use of dudhi is effective in bowel complaints. Use of bael fruit is valuable as it has astringent, digestive, and stomachic properties and is useful in restraining discharges from alimentary canal. Amarbel is alternative, purgative and anthelmintic in nature and its seeds are carminative and anodyne.

Bengal gram is stomachic, laxative and acts as refringent. Similarly, pomogranate has cooling properties and its bark is mucilaginous and juice is used as demulcent. Entire plant of dudhi is valuable in dysentery and colic.

Thus, these indigenous treatments are found to be not only cheaper, effective but also are accessible locally and easily and thus ecofriendly and sustainable.

Agr-4

Note On Livestock & Development

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Domestication of livestock for milk and draught power was a major milestone in man's progress from primitive existence to civilised life. Strangely, even now, India's economic progress is heavily dependent on livestock. It will remain so for many decades. Unfortunately, such an important productive asset is in a neglected states, resulting in colossal losses to the country, particularly to the 300 million rural poor who raise and utilise animals.

Not many are aware of the magnitude of their contribution to economic and social development. about 190 million cattle, 70 million buffaloes, 150 million sheep and goats, 10 million pigs, two million horses and camels and 200 million poultry birds constitute India's livestock, market value of which may be about Rs.70,000 crores. The value of their output is also of the same order. Itemwise break-up, in thousands of crores of rupees is milk 40, work 6, dung 9, meat 12, eggs 1, skin and others 3. Livestock contribute 10 percent to the GNP, which

would be more if the real value, or the actual replacement cost, of dung and draught power is taken into account.

In contrast, the livestock sector gets almost nothing, except perhaps a meagre subsidy only, by way of IRDP loans, which may not be more than Rs.100 crores per year. Strangely, livestock gives food products worth Rs.26,000 crores (milk, meat, and egg) and indirectly Rs.16,000 crores towards food production by way of work (ploughing and certing) and fertilizer. And yet, the livestock sector does not receive any support or infrastructure facilities to increase its efficiency.

It may be noted that the primary producers and users of livestock are the 300 million small farmers and rural folk, to whom livestock and adjunct implements and carts are the main instruments of production. By improving the productivity of livestock and related systems, these farmers-most of whom are poor-would benefit directly by way of improved employment and earnings.

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Animal husbandry is one of the subsidiary agricultural activity in the country to support rural economy. Rearing milch animals in a rural household is an important component of the village eco-system which provides not only the farm yard manure but also use the agricultural residues as feed and fodder to the livestock. The dairy products, like milk, butter and butter oil are not only used for the household but provides supplementary source of cash to the family. The Gangetic plain of the Uttar Pradesh forms the green bowl of North India and is a major contributor to the milk and other dairy products output. Though rapid strides have been made to provide an effective umbrella to health care, traditional systems for the treatment of livestock ailments are still in vogue. These are based on age old experiences and the villagers still use these traditional systems to cure many common diseases of the livestock.

Survey of such traditional systems was conducted in the Gangetic plains and the results are described as follows for some common diseases

Flatulance

Vinegar 200 ml, Nicotinated water from hucca 200 ml, are mixed and given as single dose to the ruminant twice a day till relief. in acute conditions Turpentine oil 30 ml, Kerosene oil 30 ml and Mustard oil 30 ml, well mixed, is given as a single dose to get relief within five to fifteen minutes.

Indigestion

Jaggery (Gur) 200 gms, large Cardamom 100 gms and black salt 100 gms, finally grounded and mixed, and given as single dose 2-3 times a day till relief.

Diarrhoea

During the winter season-3gms of Dhatura seeds or 20 gms of Poppy seeds, 20 gms of Katha (extract from Acacia catechu), 500 gms of Khadia mitti (white clay) is mixed in starch water derived from boiled rice. The contents are given 2-3 times a day till the relief. Dhatura seeds 5 gm, Camphor 8gm and country liquor 120ml, well mixed in starch from boiled rice (Mand), is given as a dose and is repeated, if needed. Dry Ginger powder 10gms, dry Aonla (Emblica officinalis) powder, Khand 20gms (Sugar) mixed in 500 ml water is given as a single dose and is repeated twice a day till relief.

During summer season ripened Bael (aegle marmelos), Bhang seeds (cannabis sativa), 10gm, Katira gum (Acacia modesta), is mixed with jaggery 50 gms and given to the livestock 2-3 times a day till relief.

Fever

Amma haldi (Curcuma kamada) 50 gms, Ajwain (Trachyspermum ammi) 100 gms, rock salt 200 gms, is mixed and rubbed on the pallate of the affected livestock for instant relief.

Dry cough

Rock salt 50 gms, fresh juice of Arusa leaves (Adhatoda vasica) 50 gms is mixed in Oat flour and made into bolus and fed to the animal. Butter oil (Ghee) and country liquor 100 gms each, mixed thoroughly is fed to the livestock as a single dose daily till relief. Katira gum and Babool gum (Acacia arabica) is soaked in water overnight and mixed with Oat flour 100 gms each, mixed thoroughly is fed to the livestock as a single dose daily till relief. Katira gum and Babool gum (Acacia arabica) is soaked in water overnight and mixed with Oat flour to make bolus to be fed to the livestock till relief.

Boils of the mouth

Ajwain seed 50 gms, Sows seeds (Anethum sowa) 15 gms are boiled in one litre of water till it remains 1/4 in volume (250 ml). It is given to the affected livestock daily till relief. Peppermint (Menthol), turmeric, Katha and beetle leaves are mixed in equal proportion and applied locally to the boils till cured.

Swelling of the Udder

Coriander leaves, 250 gms, are fed to the livestock twice a day for relief in 2-3 days.

Mastitis

Black pepper powder, 250 gms, and vegetable ghee as single dose is given twice daily for relief in 2-3 days.

Foot and Mouth disease (FMD)

Yolk of an egg in a litre of water is administered as a single dose in a day for 3-4 days for relief. For external application in the mouth turmeric 10 gms and Borax 10 gms, is well mixed in the butter oil, and applied to the wound in the mouth. For foot, Copper sulphate and alum is made into a solution 4-5% and applied 3-4 times a day, till relief.

Haemoregic Septicimia (HS)

Jaggery mixed with red chillies powder is given as a single dose. Drinking of water is prohibited till an hour after the medicine is given. The vein of the ear lobe is cut.

Extraction of Placenta

Gular bark (*Ficus glomerata*) 200 gms, Giloe (*Tinospora cordifolia*) 200 gms, Chirchita (*Achyranthus aspera*) 200 gms, root or leaves of cotton 200 gms, bark of Peepal (*Ficus re-*

ligiosa) are added to 3 litres of water and is boiled to half, stained and cooled. Jaggery is added and administered as single dose. Also 10-20 leaves of Mango, are fed to the livestock for relief.

Agr-6 Traditional Veterinary Practices In Tribal Region Of Nainital District (U.P)

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Traditional wisdom of any society presents an unique view which is based on their sound beliefs, norms and the culture of the society to which they belong. Traditional wisdom is built upon their day to day observation and past experiences. And this is unwritten body knowledge which is transferred from old generation to newer one. Although, traditional wisdom is more effective in its locality but they are believed to be unscientific and unreliable because of their unrecorded features and personal bias. They are recorded only in the mind of people. The creators of traditional knowledge are unaware about scientific fact or rationale behind the practices. Hence, documentation and identification of traditional practices is an urgent need and also need to be scientifically verified.

In the present paper such an attempt has been made. The tribal

people are undoubtedly the storehouse of accumulated experience and knowledge of vast indigenous flora and fauna. They have developed their own culture, value system and system of treatment. Since the time immemorial, they treat animals indigenously by making good use of locally available herbs, herbal by-products and other natural resources, for example, Tharu tribes of U.P., incase of mastitis, wash teats from extract of Bathua (*Chenopodium album*).

In the present paper an attempt has been made to document and identify the traditional veterinary practices used by Tharu tribes in Nainital District of U.P. The paper describes and discusses about the traditional veterinary practices; viz. F.M.D., R.P., H.S., bloating, loss of appetite, displacement of shoulder, mastitis, etc.

Agr-7 The New Livestock Policy: A Policy of Ecocide of Indigenous Cattle Breeds

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The Livestock Policy Perspective 1995-2020 developed by the Government of India and the Swiss Development Cooperation is a policy for the destruction of India's farm animal biodiversity and a threat to the survival of small farmers who depend on a diversity based decentralised livestock economy.

The livestock policy document totally fails to address the issue of conservation of animal biodiversity even though it has been drafted after the Biodiversity Convention was signed. In fact, by recommending the wiping out of draught power, the policy is indirectly writing a death certificate for indigenous breeds

which have been evolved as dual purpose breeds for both dairy and draught power or for specialised draught animals. By one dimensional focus on dairy and meat alone, and a deliberate destruction of the animal energy economy, the policy tacitly promotes the replacement of diverse indigenous breeds by uniform breeds from Europe. One-dimensional thinking thus leads to a monoculture of farm animal breeds and maintained through external imported inputs for an export oriented economy.

Agr-8 Conserving Indigenous Seeds and Indigenous Agriculture

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Indigenous seeds and the indigenous knowledge and culture they embody is under threat from their sources - technological change guided by a reductionist, monoculture paradigm, economic changes guided by globalisation and monopoly control

of agribusiness, TNCs and legal changes guided by narrow notions of intellectual property rights which deepen the market monopoly of TNCs.

The challenge of conserving indigenous agricultural diversity therefore involves alternative paradigms for technological progress, economic efficiency and property rights in the area of biodiversity.

The concepts and practise that emerge from these alternative

perspectives will be analysed and presented. A detailed analysis will be made of how the current campaigns on seed conservation (Navdanya), on IPRs (Neem Patents) are guided by this alternative approach to agricultural biodiversity.

Agr-9

Indigenous Seed Conservation in Gharwal

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The Garhwal Himalaya in Uttar Pradesh is a hilly zone, covering about 59% of the Himalaya (29,968 sq.km of the 50,952 sq.km). It consists of five districts: Uttarkhand, Chamoli, Pauri, Tehri and Dehra Dun. The height varies from 325m in Dhabar upto 7,817 m in the Greater Himalayas (highest peak: Nanda Devi). The hillsides are steep and terraced and are traversed by many streams and rivers of the Indo-gangetic plains.

There is a diversified range of altitudinal zones

- sub-tropical (250-1500 m)
- temperate (1500-3500 m)
- alpine zone (more than 3500 m)

The climate varies from hot dry sub-tropical river valleys to cool moist temperate in the higher hills.

The high variability of topography and climate leads to high diversity in crops. The experience of conserving native seeds in Garhwal will be reported and analysed.

Agr-10

Indigenous Conservation in the Western Ghats

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The Western Ghats form the most important topographic feature of peninsular India, extending upto 1400 km, spread over 14 million sq.km. in five Southern states, and supporting a population of 35 million. About 5 million scheduled tribe and scheduled caste people live in the forests here, their very survival depending on the natural resources of this tract, which contains 27% of the flowering plants of the country. This mountain range influences the entire population of the 5 states through modulating climate, river water flow, groundwater

recharge, adding fertility to inner valley and delta soils, providing a wide range of natural produce. Practically the entire cash crop cultivation (specifically humid tropical crops including coffee, tea, cardamom, pepper, rubber, ginger, cocoa, cloves, turmeric, etc.) in peninsular India is grown here.

On the basis of the Navdanya programme in the Western Ghats, the author shows that agricultural biodiversity needs to be conserved in-situ on the basis of utilisation by farmers.

Agr-11

Community Seed Banks - Towards Strengthening Biodiversity

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Over the last few-decades there has been a progressive decline in the number of rice varieties, cereals and millets cultivated in India. Rapid changes brought about in the technological sphere of agriculture has been largely responsible for this decline. The biodiversity and sustainability debates have led to a rethinking of what we have in our tradition. In an effort to document and understand the process by which biodiversity crop maintained by our farmers, a study was taken up in the Valaiampattu village of Chengam Taluk in the Thiruvannamalai Sambuvarayar District and Thiruporur in the Chengalpet District.

It was interesting to note that inspite of the pressures of modern agriculture several traditional varieties are being preserved by our farmers for a variety of reasons. Data regarding cropping pattern of these varieties, characteristics of the crop, classification of varieties, number of farmers who possess these varieties, reasons for preserving them have been documented. As an effort towards strengthening the process of maintenance of biodiversity of seeds, a community seed bank has been set up in the Valaiampattu village. Similar effort is being planned in the Thiruporur Taluk of Chengalpet District. This paper will highlight the details of this effort.

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Varieties, development, storage, exchange and use of seeds by the local farmers of Karnataka under indigenous and traditional methods and institutions contain several essential elements of sustainability. They are, maintenance of seed diversity which assures the continued supply of healthy, tasty, nutritional foods at reasonably low costs against any possible external stresses and shocks. Major role assigned to women in the indigenous and traditional seed system further adds to these sustainability requirements rather than mere commercial considerations. Association of traditional institutions and customs

like carrying seed varieties along with bride at the time of marriage also strengthen the sustainability dimension of the indigenous and traditional seed system. The information on the topic is based on review of literature, local seed varieties, methods and institutions prevailing among the farmers of Karnataka and other parts of India, which is documented in the journal Honeybee, IIM, Ahmedabad, Adeke patrike and Hit-talagida, two other journals in Kannada. The seed diversity and the analysis of indigenous and traditional seed system would strengthen the formal breeding and production system in India.

Consumer Responsibility towards Conservation of "Bio Diversity" - the basis of organic farming

Vanaja Ramprasad

For Navdanya and "COCO"

Conservation of genetic diversity has been of topical interest especially in the last few years ever since world nations sat together at the Bio-diversity convention. Green revolution technologies have contributed inter alia towards the erosion of the indigenous genetic diversity not only in food crops but also in the diversity that plays a significant role in sustainable agriculture. While scientists have emphasized the role of ex situ conservation they have also realized its limitations and now farmer based strategies for conservation have demonstrated the importance of conservation along with co-evolution of diversity. It is also realised that consumer awareness and responsibility are an essential fact of the conservation strategy. Navdanya as a movement has initiated through its conservation activity. The consumer collective for organic foods. The objective of the collective is

To create amongst the consumers an awareness of the varieties of highly nutritive millets and their uses,

To enable the consumer to appreciate native varieties of food

crops that are endowed with wonderful qualities of pest/disease resistance and the value of chemical free foods.

To instill in the consumer a responsibility to share the commitment to ecological production of food.

The consumer collective has evolved as a cooperative venture with emphasis on the role played by members in decision making as a participatory process.

The interesting aspect of the processes involved in forming the collective was the restrictions that were imposed in enrolling the members. Also central to the process was to ask ourselves the key question What is the difference between organic and sustainable agriculture? While sustainable agriculture has to be organic is organic farming sustainable? what are the factors that can make it unsustainable? How can a consumer collective consciously avoid it? The "Coco" evolution attempts to answer these key questions and the paper describes the evolutionary processes of the consumer collective.

A Few Traditional Practices in Rice Farming in Kerala

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Kuttanad and Palakkad are two traditional areas of rice cultivation in Kerala. A number of traditional practices are also followed by the farmers. A few significant practices are dealt with in this communication.

Kuttanad is a special tract where rice is cultivated on land lying 1 to 3 meters below sea level. It encompasses over 50,000 hectares at a

stretch spread over three revenue districts viz., Alleppey, Kottayam and Pathanamthitta. These are reclaimed land from the backwaters of Vembanad lake.

Traditionally rice is cultivated there, after bailing out water from the fields. The age-old system is the cultivation of a singlecrop of rice of about four months duration after which the fields are again flooded.

Weed management

From the very early days weeds have been a serious problem baffling the farmers. By virtue of the inherent fertility of the soil and the flow of water from upper region, the area harbour a large number of weed plants. Use of herbicides was not known to the farmers till the mid sixties. Hand weeding though effective, was not only expensive, but also cumbersome due to the dearth of sufficient number of labourers.

Under this situation, farmers evolved an efficient weed management technique by the use of water which is freely available there. The procedure will be detailed in the present work.

This can be a very good low cost and ecofriendly practice for weed management in low land rice cultivation where water is freely available.

Crop protection

Rice swarming caterpillar (Army worm) *Prodenia* (Spodop-

tera) mauritia was a serious pest in kuttanad till early nineteen fifties. The farmers used to control the insect by collection in sweep nets and also by penning ducklings in the rice fields. The ducklings used to voraciously eat away the caterpillars.

After trying a large number of insecticides and their combinations for pest control, now the scientists and the farmers are eager to practise the integrated pest management techniques for the control of a large number of pests including the brown planthopper.

In olden days farmers in Palakkad (another major rice growing area in the state) followed a practice of applying cowdung slurry on rice. Traditionally they believed that it would ward off evil spirits. Only recently it was observed that such plots are free from the attack of bacterial leaf blight disease. Taking the clue, the scientists have now recommended the spray application of supernatant liquid from 2% cowdung slurry. It is pointed out that it contains bacteriophages which help the suppression of the bacterial pathogen.

Agr-15 Sustainable Agricultural Practices of the Tripura Tribes

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There are more than sixteen tribes in Tripura, all of them are residing through centuries in the hills of the state. These dependent on the shifting cultivation practices for their livelihood. The method of shifting cultivation or Jhum Cultivation mainly based on the slash and burn method. Although there is a generalised blind blame on the tribals by the school of people advocating for the so-called high yielding agriculture that the shifting cultivation is anti-ecological because it causes high rate of soil erosion of the hills. But the investigation on this type of farming shows that the traditional Jhum Cultivation is

for more sustainable than the modern high-yielding monoculture-orientated agriculture. This type of forest based agriculture is going to be abolished due to massive deforestation and the monoculture - oriented agriculture and gardening is taken to the position. Most of the evicted Jhumias (Jhum farmers) are migrated to Mizoram and other adjacent hilly forest areas.

The observations and results on the sustainable cultivation by the tribals will be discussed during the presentation.

Agr-16 Environment Friendly Methods for Rodent Pests Management

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Rodents are by and large the most destructive vertebrate pests on earth. Since time immemorial, Man has been losing significant quantity of grains by these vermins. To check their population in the agricultural fields, he has been adopting simple, economic and effective control measures against them. By interrogating the elderly farmers of Cauvery delta, it was inferred that they are of Tanjore bow trap, pit fall trap, burrow fumigation, placing palmyrah leaves, Rat hunting by men, burrow digging, planting perching poles for avian predators

and crocodile trap. But, for the past few decades, many of these methods have been neglected by him and this may be because of the advent of rodenticides. Currently, scientists of today are searching for environment friendly methods to contain pests' menace to below economic injury level. It is deemed that the aforesaid traditional rodent control methods used by our predecessors of Cauvery delta may be of this kind and an attempt has been made to describe them in this communication.

The Farm of K.T. Thomas Kuruvinakunnel

K.T. Thomas Kuruvinakunnel
Idamattom Post, Bharananganam, Kottayam, Kerala

Shri K.T. Thomas Kuruvinakunnel is a farmer from Idamattom village in Kerala State. He has been employing environment friendly cost effective organic methods of farming for the past several years. Recycling is the basic principle behind many of the methods. He grows rubber, Coconut, Arecanut, Timber Trees, Pineapple, Pepper, Bananas, Yam, Ginger, Colocasia, Turmeric, diascoria, Medicinal Plants, Vanilla, Coffee, Cardamom, Vanilla Orchids, Anthurium etc. He also rears cows, poultry, fresh water shrimp and dammar bees. This paper intends to explain the farming methods employed by him.

The crops are grown in a multi-tier intercropping system. Nitrogen fixing perennials form part of the system. Artocarpus roots which go down lower than the rubber roots mine the nutrients and make them available to the crop in the form of their falling leaves. Soil and water conservation in the form of

silt pits, retaining stone walls, contour planting and terracing, cover crops, mulching and roadside pits is given a great deal of importance. MACS the acronym for modified Anaerobic Composting System developed by him. In this unique system of composting nutrient and microbe rich compost is obtained within a month. Ample Methane is also obtained which is used in the kitchen as well as to run the generator in the Solar Generator Hybrid Power System. The MACS compost is the main input for the crops, the others being vermi-wash, cows urine and slurry from the conventional gobar gas plant. Cows' urine is also a basic ingredient in the various bio-pesticides and fungicides used on the farm. The waste water from the toilets and kitchen are treated in a series of tanks using local water weeds, fish, frogs and water insects. The treated water is fed into the drip irrigation system.

Agr-18 The Ycmou Prayog Pariwars and Indigenous Agriculture System in Maharashtra

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The Ycmou Prayog Pariwars

The Yashwantrao Chavan Maharashtra Open University was established with the objectives to make higher, vocational and technical education available to large sections of rural population, with the help of innovative, flexible and open system of education through distance learning and to provide continuing, Adult and Extension Education with special emphasis to train the adults in new skills to enable them to adjust to the changing technological environment.

The School of Agricultural Sciences of YCMOU has innovated and established Prayog Pariwar System, through which educational and training programmes are delivered in remote, rural and hilly areas. Prayog Pariwar is the innovative and flexible system of mass agro-extension, through which any agrotechnology can be transferred among the farmers. In Prayog Pariwar, farmers with common goal and interest come together, discuss on their problems of plant protection, plant nutrition, soil and water management in crop production. The farmers experiment themselves on their farm, in individual or in groups and modify the present package of practices of crop production, to suit their agro-climatic conditions.

As the modern agriculture has created lot of environmental problems viz pollution of soil, water and air, the Prayog Pariwar has extensively started working on Indigenous knowledge system of crop production and soil and water management. Traditional values which are sustainable in nature are

tested and compared with the values of modern system by the farmers of Prayog Pariwar and try to document their factual observations in their own local language and the new and visible observations are discussed and disseminated among the fellow farmers in that area.

The YCMOU has established about 20 Prayog Pariwars, through which the indigenous Agricultural knowledge in the field of plant protection, plant nutrition, Soil and water management is collected, documented, refined and disseminated among the large sections of population. Thus the YCMOU has created a platform to convert the practicing farmers into practicing farm scientist.

Indigenous Agricultural Practices In Action

The YCMOU Prayog Pariwars has documented number of their innovations and some of the indigenous practices already documented elsewhere, are also being tried by the farmers of these Prayog Pariwar. Some of the practices, which are in action are given below.

1. Bhumi Sanskar (Soil Treatment)
2. Beej sanskar (Seed Treatment)
3. Poudha Sanskar (Seedling Treatment)
4. Nursery Management

Agr-19

Energy/Economic Implications of Green Revolution Agriculture vis-a-vis Alternative Farming Systems - A Case Study of Paddy Cultivation in Pondicherry Region

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Agro-ecosystems today are dominated by energy intensive agricultural practices that are collectively termed as the Green Revolution technologies. The Green Revolution is a capital/energy intensive, labour saving method of crop production. Modified operations center around the adoption of High Yielding Varieties (HYVs) which are dependant on substantial inputs of fertilizers, pesticides, insecticides, herbicides and other agrochemicals and modern irrigation techniques to produce higher yields. The land preparation, seeding, harvesting and threshing operations are improved and wherever possible, tractors and other machines are used to perform the operations.

The major objective of this study is to compare the energy and economic efficiency of Paddy (White Ponni) cultivation in three selected farms during Samba (November - February) season. This is the major season for paddy cultivation here.

Gloria land Farm, with an area of 40.5 hectares, a 300 cowdiary unit integrated to agriculture/horticulture crop cultivation, through the biogas plants, generating electricity and is a pioneer for alternative agriculture in this region. They use innovative techniques like square method of transplanting paddy, preparation and application of leaf deccotion (from *Vitex negundo*, *Aegle marmelos*, *Adathoda vasica*, *Azadirachta indica* and *Ferula assa-foetida*) against pests and trap cropping, upgradation of native cattle breeds by inter breeding etc. Riziere is a 2.43 ha farm, relying both on chemical fertilizers and organic manure. But synthetic pesticides are strictly avoided.

Jaganath's farm stretches over 2.83 ha. Here, both chemical fertilizers and pesticides are used. Organic manure is applied only at nursery stage. The first two farms belong to the Sri.Aravindo Ashram and the third one to a private farmer. All these three farms have black soil and grow White Ponni and two crops of paddy, Navarai and Samba.

Results will be discussed in the detailed paper. Although the question of energy utilization in agriculture is gaining importance of today, more so because of the prime importance of agriculture to human existence, it is equally important to produce enough food grains for the growing human population. Thus, the challenge before the proponents of sustainable agriculture is how to optimize the energy output/input ratio without sacrificing present yield levels with a comparatively shorter time frame. Numerous farms around the world adopting eco-agriculture have consistently produced 15-20% higher yields (than farms adopting green revolution agriculture) with reduced dependance on commercial external inputs. Earthworm culture, biological nitrogen fixation, biological control of pests and diseases and other appropriate biotechnologies etc have been developed in this direction. Hence the field is now ripe for more trials and indepth scientific studies in different agro-climatic regions of our country to demonstrate the economic viability and ecological sustainability of eco-agricultural practices.

Agr-20

Agriculture - Using Nirgundi Sticks in Improved Grain Bins

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Grain storage is an annual problem for farmers, especially in the south where too much of the crop is lost to moisture, insects and rats. Researchers in the post harvest Technology Centre at the Indian Institute of Technology have shown how an improved traditional technology could help many farmers in India.

Farmers the world over have to store their crops, both to provide food until the next growing season and to maintain a store of seeds for planting. The Traditional grain storage systems of some farmers

in the rural south result in the loss of a large proportion of their crop to termites, insects and rats.

Many grain storage systems such as metal silos, basic cylindrical bamboo skeleton plastered with cement but those systems fail to technical reasons.

It is necessary that the skeleton material be locally available at low cost or at the cost of the labour to cut it.

Farmers in the Vidarbha region of Maharashtra use a method and materials that may be applicable else where in the south. They use the stacks from the *Nirgundi* shrub for the skeleton, and they recycle *white soil* from old fortresses to make the plaster. Many of these bins are 50 or 60 years old and need only an annual plastering or amaintenance.

In this paper the conditioning of *Nirgundi* (*Vitex negundo* Linn) shrub is discussed in detail.

Finally it is proved that a study on the germinability of paddy is hot and humid regions confirmed that these binds are superior to bamboo - cement bins.

Agr-21 Contemporary Relevance Of Vrکشayurveda In Pest Control

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Ayurveda or the Science of Life, pays equal attention to the maintenance of good health as well as to the treatment of diseases. Hence it is not surprising to see that in the Science of Vrکشayurveda also we find an enormous and elaborate literature not only on procedures for maintenance of plants in good health and promotive measures, but also methods for the treatment of various plant diseases. This paper attempts to give an overview of Vrکشayurveda and highlights its contemporary relevance.

1. Diseases have been classified as occurring due to endogenous origin there is a detailed scheme to analyse and understand the diseases and a line of treatment is also provided for different diseases.
2. Various categories of diseases of exogenous origin are described. They include diseases due to worms, insects, parasites, fire, hail, storm, cold, wind, burns, etc. For all the above conditions the line treatment is suggested.
3. Besides what is described in the texts of Vrکشayurveda there is also an extremely rich and varied variety of knowledge and practices that still prevail with our farmers. These practices make use of materials available

locally in various areas and provide excellent methods to deal with diseases based on local considerations. The methods cover a wide variety of approaches, including the use of botanical materials, animal products, mineral products, agronomical practices, cultural practices, the use of traps and physical devices as well as the use of biological methods.

Methods drawn from Vrکشayurveda in this area can constitute an excellent starting point in the following manner-

1. Techniques that are already in use by farmers can be examined rigorously in the field as well as analysed in the light of Ayurvedic theory.
2. Using the principles and theories of Ayurveda, one can extend the use of currently available and used material to new situations and problems.
3. Finally it seems possible that one can come up with a line of treatment for various new pest and disease conditions (i.e hitherto not described in the literature on Vrکشayurveda) starting from the basic principles and theories of Vrکشayurveda.

Agr-22 Tradition in Transition: Agriculture in the Javadi Hills

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The paper attempts to focus on the process of change in agriculture with the help of primary and secondary data from the Javadi hills, North Arcot and Thiruvannamalai districts in Tamil Nadu. Villages in the Javadi hills have been grouped into traditional, transitional and modern based on certain criteria. Parameters chosen for the grouping include the number of traditional varieties cultivated, presence of mixed cropping

patterns, labour exchange networks, land use practices, ethnic groups, distance from the road, no. of wells, gross cropped area, net sown area, gross irrigated area, percentage area under cash crops, percentage area under food crops. The paper also tries to show how some areas are able to accommodate to change while others fail.

Agr-23 Seed Treatment and Storage in Yester Years- A Traditional Technology worth Revival

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All food is seed is a statement far more embracing than the metaphor that all meat is grass, which clearly depicts the omnipotence of seeds; seeds have been used to raise crops during the right season to fulfill our food, fibre and fodder requirements. In general all seeds cannot be used in their pristine forms and often they are subjected to various pretreatments in order to break dormancy, accelerate germination process, enhance the seedling vigour, avoid pest and disease outbreak etc. The various pretreatment process involves water/solution soaking and leaching, density separation and grading, hardening, seed coating with organics and botanicals etc. are highlighted in detail along with their scientific facts to prove the validity of these traditional technologies to the present day condition.

Exposing stored pulses (gram) seeds at nights during cold months (Dec-Jan after the North East monsoon) followed by exposing them during the day and storing them back again was

a traditional practice in many parts of South India to prolong the shelf life of the seeds. A recent study by Basu, R.N. in 1974 revealed the reduced lipid peroxidation and lowered aldehyde production as a result of moistening (slow hydration-due to mist) followed by drying enhanced the shelf life of the seeds. Many such traditional technologies with their scientific basis are also discussed in the paper.

There are several traditional technologies which are region and location specific. Many of our traditional technologies are lost in the name of modern day agriculture. Several countries and multinationals around the world are trying to document, research and reintroduce the same for a price. It is high time that the Indian scientific community sit together, collect information on traditions from their respective region, research and bring out scientific facts and myths underlying the traditions and share the common benefit with the farmers for a sustainable future.

Agr-24 Case Study Of Organic Farms

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A detailed discussion on three different models of organic farms representing large small and subsistence land are attempted here.

The large farm which is partly monocropping with perennial tree crops like Rubber and partly a coconut based multicroping system. this farm incorporates several enterprises like livestock, poultry, Gobar gas and innovative composting and biogas generating systems.

The nutritional requirement of the farm is met through aerobic and anaerobic composting wherein the agricultural wastes alongwith cowdung is used in both the composting systems. The wastes used for composting after being cut into small pieces are piled up on surface in an area of about 30 sq.feet at a height of 1 feet. This is added with cowdung and urine alongwith kitchen wastes on the top of the pile in a 4-6" thickness. A frequent turning of the pile once in 10-15 days helps the material in getting thoroughly mixed which enhances the rate of composting. The manure is thus prepared in a month's time. Anaerobic composting method is also followed. The compost is obtained in a month's time after the last filling of the pits. Methane gas emanating from the composting unit

is collected for domestic use. This is collected within a reinforced plastic dome placed with the help of a support inverted into the well. Other innovative features will be discussed during the presentation.

The small farms are primary examples of perennial tree crop based multicropping system dependent on organic methods of nutrition and pest control. The main features of these farms include land development for soil and moisture conservation, organic nutrition and multicropping with food crops and medicinal herbs and organic pest control methods.

Land development consists of inward sloping contours, coupled with vermi silt pits, trenching and biobunds etc.

Contours cum vermi silt pits are prepared in these small farms.

The contours are made in the sloppy areas before the planting of rubber, the main crop. This helps in the re-charging of the ground water resources.

Pineapple, one of the multicrops incorporated in the system is planted in trenches of 3 feet wide and 1 1/2 feet depth. This serves to check the soil erosion which is made more effective

by the presence of biobunds. The biobunds are prepared using the soil taken out from the trenches. Fodder grasses and other soil stabilizing local plants species, and Nitrogen Fixing cover crops planted along the bunds add on to the soil and water conservation measures on the farm.

The border alley cropping consists of two rows of nitrogen fixing trees which includes Gliricidia and Leucaena species. These are kept lopped at a height of 8 feet and used for green manuring and composting purposes. Leucaena also serves as a good fodder for the livestock.

The organic nutrition techniques adopted in the farm includes vermicomposting besides green manuring using Gliricidia

leaves. Use of other organic sources of plant nutrition like bone meal, ash etc. is also done.

Various crops incorporated into the multi cropping system includes fruit crops like banana, pineapple, papaya; seasonal vegetable crops, spices and upto 20 species of medicinal herbs. These are grown in the immature phase of rubber during which open sunlight is available in the farms.

Subsistence Farm

The third model is that of a marginal women subsistence farmer. This farm mainly consists of vegetable crops raised organically and primarily for home consumption.

The details of these farms are described in this paper.

Agr-25

Plant Protection Practices in India from Lokopakaram and Vrکشayurveda

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Vrikshayurveda-the science of treating the plant health has been a major concern in the ancient Kannada and Sanskrit texts of India. This amply indicated that plant health was accorded a prime position in the history of agriculture in India. The three major ancient texts which provide a strong footing to Vrikshayurveda are:

- (1) Varahamihira, 505 AD, Brihat Samhitha, Vriksshayurveda Part I, chapter 55 (edited by M.Ramakrishna Bhat, Motilal Banarasidass, Bangalore, India, 1981.).
- (2) Chavundaraya, 1025 AD, Lokopakaram, Vriksshayurveda Chapter 6 (edited by H.Shesha Iyenger Governmental Central Manuscripts Library, Madras, India, 1950).
- (3) Sarangadhara, 1363 AD, Vriksshayurveda, (edited by S.K.Ramachandra Rao, Kalpatharu Research Academy, P. Box 1857, Bangalore, 1993, India). In this paper we present in order a few indigenous methods of plant protection as outlined in ancient texts.

Common Features

The authors of the ancient texts, mention the painstaking efforts they have taken while observing and researching on the indigenous methods they have documented. The development of the body of knowledge in Vriksshayurveda need to be viewed in the pest-disease scenario prevalent 10 to 15 centuries ago, during which many of the current pests/diseases may not have existed. The different methods have common characteristics inter alia

- (1) multi-pronged attack on the pest/disease,
- (2) improving the plant health thereby increasing the resistance capability,
- (3) enriching soil with nutrients and increasing useful microbial activity, and
- (4) broad-spectrum effect on posts/diseases.

Ancient texts of India-Varahamihira Brihatsamhitha (5th Century AD), Vriksha Ayurveda of Lokopakakra (9th Century AD) Vriksha Ayurveda of Sarangadhara Samhitha (13th Century AD), provide recommendations of the plant protection practices based on indigenous knowledge. They provide indications of an integrated approach to control crop pests and diseases through soil, seed, plant and environmental treatment. The seed treatment with cowdung, milk, juice of Solanum indicum L. (Gulla) (fam:Myrsinaceae) and cow ghee is prescribed. As prophylactory measure for disease control, the incense of Embelia ribes (Vayuvilanga), Commiphora wightii (Mahishakshi) (fam: Burseraceae), fish meat, turmeric, mustard, flowers of Terminalia tomentosa (Mathi) (fam:Combretaceae) are mentioned. The prophylactory pest control measure includes soil application of the mixture of Ferula foetida (Ingu) Embelica ribes (Vayuvilanga) (fam:Myrsinaceae), cashew seed, Barleria busivolia (gubbi balli ?) (fam: Acanthaceae) or Chelianthes farinosa (gubbi balli ?) (fam: Polypodiaceae), mustard, cow horn creeper in cow urine.

Agr-26 Panchagavya - A Natural Environmental Friendly Recyclable Product for Plant Disease Management

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The hazardous nature of plant protection chemicals is increasingly being felt by one and all. The scientists, who are involved in plant protection are concentrating on the alternate methods to keep aside the use of chemicals. Any methods or innovation however small is its impact, should be considered as a step in this direction. In this regard our work at The University of Agricultural Sciences, Bangalore, India on the management of the fungal pathogen of tomato crop is significant.

This soil borne pathogen *Fusarium Oxysporum*, *F.lycopersici* causes seedling disease and adult plant wilt in tomato. It is distributed all over the world and the damage caused ranges from 10 to 100 per cent depending on the environment. Among the many organic products tested by us, Panchagavya an organic formulation is found to be promising and environmental friendly.

In Sanskrit, panchagavya means five products from Cow, a revered animal by Hindus. It is ancient ritualistic practice prescribed in Hindu scriptures to administer Panchagavya to human beings under many conditions full health, convalescence and as a spiritual purifying agent. In addition, the panchagavya preparation is also recommended as a cure epilepsy, jaundice and fever in the ancient system of medicine in India. Testing of this product in a modified form on plant disease was prompted after reading the work of Jim Martin in the 1950's on Living water which consisted of cow urine, sea water and other ingredients as reported by T.Curtis (1992) in Spain.

In our study, three modified formulations were prepared and tried. Modified form of Panchagavya-3 was found to be the most effective and economical. This is prepared by mixing two Volumes of Ghee, five of curd, five of milk, 40 of urine and

40 of dung, all fresh from cow. To this was added two per cent of common salt and 0.01 of baker's yeast and was allowed to ferment for ten days with daily stirring. This slurry was filtered and the filtrate was diluted ten fold. This was used to dip the seedlings of tomato and for spot application after transplanting in the soil previously inoculated with the pathogen (sick soil). Two applications to soil around the plants were given at an interval of ten days. Two more treatments were also used namely, (1) neem cake and (2) neem cake with MPG-3. Two checks were maintained, one with seedlings in healthy soil and another in pathogen sick soil. We found that MPG-3 was superior to carbendazim in reducing the plant disease index, and in increasing the vigour of plant and yield. We also found high microbial activity and low pathogen population in the soil treated with MPG-3. Inhibition of pathogen in vitro was recorded. However, we could not go further in finding any specific microbe or a chemical responsible for the observed results as we could not continue the work further. We feel that MPG-3 acts both directly by suppressing the pathogen and by increasing the vigor / resistance of the plant. Suppression of the pathogen may be, by encouraging the local antagonists of the pathogen. It is interesting to note that MPG-3 has inhibitory effect on *Fusarium Oxysporum* f.sp cubens causing banana wilt. This was observed by other scientists of the Department of Plant pathology UAS Bangalore later.

Looking at these findings, Panchagavya is definitely promising formulation in the years to come. There is a need for further research to understand in depth the active components produced in the mixture and their mechanism of action and to develop and test various formulations of products from cow and other livestock. Meanwhile it is necessary to extend and test the use of this present formulation against other diseases.

Agr-27 Standardization of Cow-dung-Urine Slurry for use in Sustainable Agriculture

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Three types of slurries were prepared using cow-dung-urine as base. These were enriched with nutrients and standardized their biochemical nature. Slurry A was prepared by using cow-dung and urine in 1:1 proportion. Slurry B was prepared by using cow-dung and urine, and was enriched with known

content of nutrients. Slurry C was prepared by using cow-dung alone and enriched with known concentration of major nutrients. The slurries were incubated at 28°C upto 30 days. The changes in the biochemical nature of these slurries were determined at 3,4,5,6,7,15 and 30 days after incubation. The ana-

lytical data indicated reduced pH and increased amount of nitrogen, available phosphorus, potassium, microbial count and production of growth promoting substances. It was noticed that pH was reduced from 7.6 to 7.2 during incubation. Total nitrogen content was increased from 0.37 to 1.75 per cent,

available phosphorus from 0.58 to 1.68 per cent and available potassium was ranged from 0.35 to 1.00 per cent at various intervals. The microbial abundance was increased from 14×10^5 to 46×10^5 cells/ml. The growth promoting substances were measured from 60 to 100 mg per 100 ml of slurry.

Agr-28

Studies on the Utilisation of Silkworm Excreta for Vermiculture (*Megascolex* sp) and on Germination and Growth of Plant *Vigna Sinensis* (Cow pea)

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The role of earthworm in consumption of surface litter with mineral soil and in litter breakdown enhancing decomposition and mineralization of nutrients has been studied extensively over decades. There are so many commonly available compostable materials like crop residues, rice straw and husk, Wheat straw, Barely straw, animal shed wastes, human habitation wastes, Kitchen and vegetable wastes etc. The potential of earthworms has led to many attempts to improve poor and reclaimed soils.

In the present study low-fertility soil was utilized in combination for earthworm culture and organic waste recycling (Silkworm excreta). The results showed that the earthworm growth was decreased 30.78% in low fertility soil. Earthworm growth was enhanced 19.46% more than that of control worm culture

when unfermented silkworm excreta was added at 10% of the body weight of worms to the low-fertility soil. Fermented silkworm excreta also enhanced earthworm's growth, (18.52%) over control but not higher than unfermented silkworm excreta. The mixture of soil and silkworm excreta used for worm culture was tested on the germination and growth of *Vigna Sinensis* (Cow pea) for 12 days. The results indicate that the plant dry mass (0.017 mg/plant) and chlorophyll (0.008 mg/g leaf) were not increased when the soil mixture with silkworm excreta after growing the earthworm was used, while in the control soil, plant dry mass was 0.021 mg/plant and total chlorophyll content was 0.011 mg/g leaf. Results will be discussed on the light of further treatment of silkworm waste for better utilization.

Agr-29

Biotic Factors in Traditional Rural Agricultural Technology and Training

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Of late use of biofertilizers to the crops have come to the light because of high cost of chemical nitrogen, poor and organic content of the soil, improper crop rotation methods and indiscriminate use of chemical fertilizers.

By applying these biofertilizers, amicable host parasite relationships are maintained. Ecofriendly predators availability is established and restored. Bio conversion of organic wastes into resources leads to protecting environment from getting polluted. Also improves the organic content of the soil. Hence future generations can only think of integrated judicious fertilizer management and establish the traditional agriculture and cultivation of plants in a sophisticated manner using Science and Technology methods.

The farms and gardens have to be self supporting economically in order to survive. The school believes that it is essential to carry the Science and Technology to the rural exams by giving training to the young people with low cost technologies. This traditional college which believes to maintain the traditions has

started one year PG Diploma in Biofertilizers. First time in India, Diploma in aquaculture, certificate courses in mushroom cultivation and medicinal plants. The department of Botany is running a DRDA programme on mushroom cultivation and educating the unemployed and under employed people. With the support of DST, ICAR schemes which are eco friendly, the micro organisms are identified to the farmers i.e., namely Vesicular Arbuscular fungi, algae and bacteria. They are mass multiplied and given to the farmers. The department also conducted training programmes with sugar industries and trained cane officers and cane assistants in biofertilizer applications and biocontrol of pests. It has also identified sugarcane specific microorganisms as supplement to nitrogenous fertilizers. Recently, the entire Tanjore delta was also surveyed for phosphate solubilizing fungi and bacteria.

Still more alien micro organisms to the crops are being surveyed with the support of UGC and ICAR schemes to different crops. Presently started vocational course on Industrial microbiology was started at undergraduate level which will certainly

carry the science to the rural population and also have a tie up with local Industries with the saying think globally and act locally.

When the gap between the employment and food production is widening, the only way is to give more training and educate the rural people to live with nature as Nature has a magical way of falling the world with wonders.

Agr-30 Non-Chemical Pest Control: A Review of Select Botanicals

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The information provided here is based entirely upon literature review. An analysis of the indigenous knowledge about pest ecology and methods of pest control useful in agriculture of 38 plants have been discussed here taking into account the poisonous nature of their constituents, degree of toxicity, duration of effect and several other aspect.

Lab experiment on the aqueous extract of the leaf of *Citrus medica* and *Erigeron bonariensis* (conc. 1:1) shows antifungal properties against *Asperigillus flavens* and *A.versicolor*.

The ether extract of plant *Milletia pachycarpa* has been found to be effective against houseflies and silk worm larvae eggs. It exhibits ovicidal properties and also acts as a stomach poison and contact poison. Although it gives promising result but its use is not economical in field operation.

An essential oil obtained by the hydro-distillation of the fresh leaves of *Callicarpa macrophylla* was found to act as a growth inhibitor of several pathogenic bacteria and fungi.

A laboratory study on the leaf extract of acetone, methanol and petroleum ether of *Premna integrifolia* was carried out which showed its antifeedant, insecticidal and antiovipositional action towards *Callosobruchus chinensis*, a stored grain pest of pulses at 2.5% concentration.

Quassin was identified as the active principle in *Picrasma quassiodes* for its insecticidal activity towards American cockroach (*Periplanata americana*). The methanol extract of the

root bark of *P.quassiodes* showed strong insecticidal properties, the active components being Quassin, neoquassin and picrasin.

However commercial extraction and processing require expensive and sophisticated techniques which are beyond the reach of small farmers. Instead farmers' may develop technology suitable for their agro-ecological contexts if they have access to the scientific information in a flexible form. If the technology proves to be effective at an experimental level, perhaps it can also be made commercially viable. To facilitate non-chemical pest control, a bridge should be established between farmers' knowledge and the scientific research and development. The contribution made by the people through whom we collect information must be duly acknowledged. We also have to safeguard the Intellectual Property Rights of the farmers.

SRISTI is trying to develop strategies for documentation of indigenous herbal and non-chemical pesticides based on farmers own innovation or traditional ecological knowledge. To find out the effectiveness of these, it is carrying out on farm and on station research experiments through blending of scientific knowledge for sustainable agriculture. Sristi is also advocating for the intellectual property rights of grassroot innovators.

This paper is a part of the research work which is being pursued at SRISTI.

Agr-31 Tackle the Agricultural Pests Problems by the Traditional Way

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The time has come before us to look into the treasure of indigenous knowledge system existing in this part of the country consequent to the development of various problems such as pesticide resistance in insects, pesticide contamination in foods, poisonous effects of the pesticides on human kind and animals owing to frequent and wide spread use of pesticidal chemicals in agriculture. Age-long practices that have been followed traditionally, to do away with the pests problems by our rural and tribal folks are of immense value and appropriate for the present. Such treasures existing in remote villages, tribal areas etc. are set to vanish from us because of too much

urbanisation, movement of people and unlimited ambitions of man. It is time to keep hold of such age-old practices to keep environment safe and obtain rich harvest from the land. Hence, an intensive drive was initiated to document such of those indigenous pest control practices from a wide range of regions in districts such as South Arcot Vallalar, Salem, Dharmapuri, Tiruchirapalli, Madurai, Pudukottai, Pondicherry, Periyar, Coimbatore, North Arcot, Ambedkar and Tirunelveli and certain tribal pockets also were visited and great tamil scholars were interviewed for the purpose. Besides efforts were made to scan references of such traditional practices from Tamil

literatures and the great epics of the nation. Nearly 600 practices were thus pieced together and the crops covered were rice, maize, cumbu, cotton, coconut, oil seeds, castor, sesamum, pigeon pea etc. Of these, 22 practices were chosen for scientific evaluation in rice field and 20 in storage godown to protect grains from pest attack.

Most of the practices adopted in the study were of mostly plant materials and their by-products and were said to have been quoted in tackling various rice pests like brown plant hopper, green leafhopper, leaf folder, thrips, stem borer, and other practices for other common pests had been catalogued.

The traditional technologies are easily accessible to the farmers with minimum cost and effort so as to obtain an effective pest control. The use of Neem oil, Neem leaf, Neem seed kernel extract, Neem seed bitters, Adathoda, Nochi, Ipomoea, Agave, Leaf extracts. Calotropis latex, use of clay, kerosene,

and saw dust are recommended from our study. We found that Neem oil, Neem seed bitters, Saw dust + Kerosene could be used to tackle pests like brown planthopper, green leafhopper etc. and for coterpillar pests Tobacco leaf extract, Neem seed kernel extract, Calotropis latex, were effective. For rice Ear head bug the Cycas male cone was very effective in the field condition followed by Neem cake extract. Thrips was controlled with calotropis latex. Most of the botanicals used in the study were repellant in action, allowing only minimum pest damage.

It becomes therefore clear that traditional practices which were developed by our forefathers and subsequently followed, are worth practicing to check or manage the pests problem in crops. It is therefore time we use them scrupulously and obtain good yield towards prosperity of nation and save the environment from poisonous agrochemicals.

Agr-32 **Agriculture in Ancient India with Special Reference to Seed Technology**

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Agriculture and animal husbandry started developing in India from pre-vedic period, because in the Rigveda there are references to hundreds and thousands of cows; the horses yoked to chariots and race-courses; to camels yoked to the chariots; to sheep and goats offered as sacrificial victims and to the use of wool for clothing. The Vedic Aryans developed to a degree of skill rarely known to other parts of the world. In social rank, the farmers were considered next to Brahmans, and the entire village administration appears to have been in the hands of leading farmers. In the medieval period under the Hindu rulers, there are evidences of raising the crops like wheat, gram, pulses, barley, sugarcane, indigo, cotton, pepper and ginger. The plantation, preservation and forest conservation are the fundamental articles of Hindu religion, because the Indian culture began to be developed under the shades of trees where the Rishis dwelt. In the Atharva Veda, it is mentioned that, the Vedic Physicians were procuring the plants and herbs from the forests and rearing them for treating the diseases and pests of human beings, domestic animals and crop plants. They were also utilising the animal products (milk, ghee, cowdung etc.), mantras and astrological knowledge for treating the diseases. Seed technology was very much developed in ancient India. The Vedic Aryans developed sufficient skill and expert in seed classification, preservation and maintenance of seed viability.

The sages have said that the preservation of the best kind of seeds consciously brings prosperity to the cultivators. The

cultivator should buy and store the seeds and should sow them in his own field duly ploughed by oxen in the right manner and in proper sequence and promote their growth by watering them at proper times. They classified the seeds into four classes, the first the cereals, the second the vegetables, the third the creepers including trees and the fourth the flowers. The ancient agriculturists are very much aware of the crop varieties suitable for different agroclimatic conditions. For example in the Indian Museum, 5000 forms of rice have been collected. Observing these forms Sir George Watt told these are probably not all distinct, but even if halves, the number would still be sufficiently significant of the vast antiquity of the cultivation.

Surapala in his book Vrikshayurveda had written a number of verses regarding the protection of seeds from diseases and pests and maintenance of its viability. According to him, one should gather the seeds ripened in full time dry and steep them in milk, remove them out and then dry for five days. Thereafter he should fumigate them with the fumes of ghee in which Vidanga (*Embelica ribes*) has been mixed. Then one should rub the seeds softly in the ashes of five parts, such as, root, bark, leaves, flowers and fruit of Brhati (*Solanum*) and Kurari (*Capparis aphylla*) mixed with Vira (manioc root) for five days. Then he should soak the seeds in the dung and urine of cow for one day. Afterwards he should smear them with cowdung and sprinkle with milk. This protects the seeds and preserves its viability to a great extent. They were also sowing

the seeds in the auspicious moments by choosing different days, constellations, fortnight and months.

There is a saying the camphor has been volatilised but the cloth is lying behind. Likewise most of our traditional technologies in agriculture have been suppressed due to the introduction of modern agriculture after independence. In the modern agriculture we are cultivating the high yielding varieties of crops by utilising the chemical fertilizers, pesticides and growth regulators. The use of chemical compounds in agriculture has limitations like pesticide resistance, environmental pollution and ecological imbalance. These limitations now forcing the scientists to search for non-chemical approaches of crop man-

agement. The western countries have realised and faced the above limitation to a greater extent. But fortunately, India has not yet face such problems except in towns, cities and their adjoining areas. The traditional technology is still existing in the farming communities of rural areas in dormant stage and it is still becoming dormant due to lack of scientific and systematic study. Therefore, proper scientific and system study in this line by the researchers and encouragement from the Government agencies will certainly enhance our traditional agriculture and generate new low cost technologies which will be eco-friendly and easily acceptable by the farmers.

Agr-33

An Economic Analysis of Buffalo- A Traditional Animal

B.R.Garg, K.K.Jain, & Narinder Kumar

Livestock has formed an integral part of Indian agriculture since time immemorial. In the pre-historic days of Lord Krishna livestock husbandry was synonymous with the cattle husbandry and since then cow has assumed religious significance. With the passage of time, another high yielding milch animal-buffalo got introduced into animal husbandry in India. Buffalo milk is being preferred for its taste and high fat contents by a large section of people while cow milk has its own merits as its consumption is considered beneficial for children, sick and old people. Besides this, cow husbandry has assumed an added significance in India as its male forms the main source of draught power of farm. Lately, the introduction of exotic cows and the programme of cross breeding with the local cows was started to increase the milk production. With the induction of this cross breeding programme in cows for higher milk production and introduction of farm mechanisation in Indian agriculture, local cows have got low preference due to its low milk yield and declining demand for its male. In the modern age of commercial agriculture, local cows with low yield potential are being replaced by cross bred cows and more over the need to rear local cows for draught power seems to be eloping with introduction of mechanisation in agriculture. The traditional rearing of cow herds by nomadic tribes too is on the wane due to low economics of such animals and changed resource position over time particularly related with the availability of pasture lands and temporarily settlement places. Also, the full benefits of cross bred and the exotic cows could not be realised as these animals have not adapted to the local Indian conditions due to certain limitations. On the other hand, buffalo has successfully withstood the onslaught of exotic and cross bred cows in spite of big Government support to promote

these animals. Presently out of the two major milk producing species, namely, buffaloes and cows, buffalo seems to have an edge over cows because of its higher yield potential and people's having distinct preference for its milk. At present bovine stock count for 66.30 percent of the total milch livestock animals in Punjab, which included bovine and cattle. Thus, there is a reason to explore the factors which had brought the population of buffaloes to form a major segment of milk producing livestock in this agriculturally most advanced state of India.

The endeavour in the present paper would be to

- i) study the growth in cows (both local and cross bred) and buffaloes over time,
- ii) identify the factors due to which, buffalo - the traditional animal has survived the onslaught of cross bred/exotic cows.
- iii) study the important parameters which may help this species to gain advantage over its competing species.

In addition to this, efforts would be made to examine the factors which need further research, keeping above all the interests of the nation, towards fulfilling the future demand of dairy products under the given resource constraints of the Indian economy.

To achieve the objectives of the study both primary as well as secondary data will be collected from various sources, like Directorate of Animal Husbandry, milk plants in public/private sector etc. in Punjab. Suitable statistical techniques would be used as and where required to reflect the significance of the findings.

Vedic Agriculture

(Natural Farming/Ecological Farming/Organic Farming processes for the guidance of the Modern Farmers)

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Fermented Manure

1. Fermented Liquid Bio-Manure for Trees-Bushes at 2 Litres each (5% Salt + 25% Raw Cow Dung + 0.1% Yeast)
2. 25% Curd Solution/Butter-Milk soil-drench (20kg Curd per Acre)
3. Toddy Liquor Soil-drench (20 litres per Acre)
4. Tobacco Fermented Decoction (20kg of Green Leaves per Acre)
5. Fermented Seed Decoction soil-drench (50 kg of germinated seeds per acre) of Guar, Cowpea, Neem, Tamarind, Jaamun, Myrobalan, Amla, Mhowa, Pungam, Castor, Cordia, Soapnut, Seethapal, Jujube & Mustard
6. Fermented Decoction of Green gram/Black gram + Gingelly/Mustard.

Soil-Treatment

(For Plant Growth/Disease Prevention/Pest Control/Soil Nourishment)

7. Mineral Fertilisers: Rock Phosphate/Potassium Nitrate/Borax/Magnesia/Magnetic Iron Oxide
8. Soil-dressing of the powder of anyone of the following (5kg seed per acre of Vidanga/White/Mustard/Neem/Cordia/Fenugreek or 5 kg Tuber per acre of Garlic/Sweet Flag)
9. Tree Basin soil-Reinforcement (Coal Brick/Rock-wool/Cow Horn/Copper sulphate brick)
10. Soil-incorporation of the Electrolyte Leaves of Calendulas/Achilea/Cordia/Callophyllum/Basella/Tinospora (1kg Leaves per Tree)
11. Earthworm vermi-wash liquid humus soil-drench (1 litre per tree)
12. Soil-dressing of 100 kg per acre of Non-Edible oilcake Manure as Neem Cake/Pungam Cake/Casior Cake/Tung Cake/Chalumoogra Cake/Angolam Cake/Cordia Cake
13. Sugar factory press mud (5-10 Tons per Acre)

Seed Treatment

14. Seed-Treatment with Angolam oil/Alangium lemarki or Cordia oil/Cordia sebastiana
15. Seed-mucilage of Psyllium/White Mustard/Fenu Greek/Pedaliium Murey Treatment of the seeds to be sown

16. Leaf-mucilage of Alge/Mallow/Basella/Sanjivani tinospora cordifolia, treatment of the seeds to be sown
17. Seed-Treatment with Sweet Flag or Vidanga/Embelia ribes or Gingelly or Carissa Caronda or Indian Night Shade or Michelia Champaka leaves

For giant Fruiting of Trees

18. Stem-brushing of any one of the following powder in Neem oil/Mhowa oil/Pungam oil/mustard oil/Fish oil (1kg oil per tree)
Myrobalan Powder/Amla Powder/Nut Gall Powder-Quercus infectoria/Fenugreek powder
19. Petroleum Wax Stem-brushing/Sodium naphthenate 1 kg per tree
20. Air-Fertilisation with Liquid Carbondioxide of the Tree
21. Soil dressing of Gingelly and Angolam fermented in 4% Salt solution or Gingelly and White Mustard fermented in 3% Sugar solution
22. Agri-magnetism/Nailing of Banana/Papaya/Mango/Coconut Trees (G.I.Nails/Copper Nails)

For Profuse Flowering of Tree/Bushes

23. Soil-drench of 25% Fermented Curd solution/Toddy Liquor/Sugarcane juice (20 litres per acre)
24. Soil-dressing of 2 kg of Milk Powder per acre

Disease Control Prays for Trees/Bushes

25. Pharmaceutical Asafoetida 1kg per acre/Milk powder 2kg per Acre/Yeast 2 kg per acre/Nut-gall 2 kg per Acre/250 gm Vitamin C per Acre/5kg Garlic per Acre
26. Aquecus solution with Sodium Lauryl Sulphate of any oil as Neem oil/Mhowa oil/Myrobalan oil/Amla oil/Pungam oil/Croton oil/Mustard oil/Chalumoogra oil/Soapnut oil/Fish oil/Seethapal oil/Thevetia oil (5litres per Acre + 50 gm of Sodium lauryl sulphate powder)
27. Tobacco/Garlic/Mustard/Embelia Decoction (5kg per acre)
28. Leaf Powder spray 20 kg per Acre (Vilvam/Tinospora/Basella/Hiptage/Bougavilla/Lawsonia)
29. Natural pigmenta spray (Titanium dioxide/Magnesia/Potassium Permanganate)

Pesticidal Fumigation of Trees/Bushes

30. Burning of the seeds on Dung-Cake of Myrobalan/Soap

nut/Thevetia or Dry Leaves of Aamla/Tobacco Straw (1kg per Tree)

31. Burning of the seeds on Dung-cake of Mustard/Embelia/Anise (100 gms. per Tree)

32. Pesticidal spray of Palmarosa oil/Geranium oil (250 ml per acre)

33. Fungicidal Fumigation/1 kg Benzoin per acre/10-20 kg of Sulphur powder per acre

Natural Manures

34. Microbial Manure: Yeast 5 kg per acre/Rutin Green Manure 1ton per acre/Earthworm 50 kg per acre/Milk powder 2 kg per acre/Nut-Galls 5 kg acre/Calendula flowers

35. Rutin Green Manure: (1 ton leaves per acre/10 kgs leaves per tree; Board Bean/Velvet Bean/Winged Bean/Citrus Peel

36. Muscilage Manure (1 tone leaves per acre)

inosporacordifolia/Bosella/Calendula/Achillea/Cantella Asiatica/Clerodendron pholoide/Psyllium husk 100 kg per acre/Algin 1 kg per acre/Aloe leaves 100 kg per acre

37. Fruit Manure (100 kg per acre): Neem/Aamla/Myrobalan/Angolam/Mohwa/Cordia sebastiana/Acid Lime/Solanum nigrum/Carissa Caronda

38. Enzyme Manure (100 kg per acre)

Germinated seed Extracts of Ouar/Tarmarind/Jamun/Sithapal/Kodukapali/Pungam/Neem/Ber/Caronda /Aamla

Flower Tincture Soil-drench

39. Calendula Officinalis/Achillea milifolia/Arnica montana/Sambucus nigra

Secondary Thickening/Trunk Fattening:

40. Leaf mash of Calendula officinalis/Achillea milifolia; chitosan/Tannin/Fish oil/sodium naphthenato

Agr-35 Ecological Dynamics of Traditional Technology Practices in Small Farming Ecosystem: Some Observations from Karnataka

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Present day agrarian sector needs more ecological concern than ever before. The conventional agricultural practices face lot of crisis due to increasing cost of cultivation. This is mainly due to decreased input use efficiency and the sustainability of farming systems. Also due to increased cost of inputs, labour charges and added risks of the routine practices.

In Karnataka majority of farm population are marginal (holdings up to 1 ha) and small (holdings between 1-4 ha) farmers, covering about 75% of the land holdings and 35% of the area. The approaches in modern agricultural operation strategies in land dynamics are suited to large farming systems with only 1-2% of land holdings covering 12% of the area. This has made small farming system as non lucrative due to lesser profits. But the small farm operation has a long time benefit of the sustainability of the system operation.

Small farming ecosystem reserves a rich source of traditional technologies. Economical reason is one of the several hundred reasons, which are still more important in helping to maintain such diverse practices. The ecological dynamics of such a farming practice lead to a healthy soil environment, new technologies always supported rich farmers as they require additional inputs to grow successfully. These practices just not reduce the inputs, but also minimize risks by maintaining traditional and ecologically sound technologies. The improved technologies may flood the market with output, but it causes high depression on local food stuffs adding maximum risks.

In a district level analysis of Ragi (*Eleusina coracana*, L.)

ecosystem, just three taluks contributed to conserve over 125 varieties of ten different crops. The large interest of such an each traditional variety maintenance was very specific in respect to their importance in cropping system. They used generally, to reduce input cost, risks of farming and control of specific pests, weeds when they were grown as mixed crops with other crops. One specific example is that a cereal Navane is mixed with sorghum/maize, which controls the emergence of striga, a root parasite in sorghum/maize. The whole practices were maintained largely with all level of farming practices by seeds through harvest till storage. The reach of certain inputs, if beyond the poorer farmer, the attempts made to get them costs even higher than the actually required investment. A soil analytical measure evidences the accumulation of organic matter is substantial in small farming ecosystems. The desired situation is to support the traditional practices, which minimize risks. The present document is an evidence such of a situation.

Hence a technical analysis of these practices evidence the situation of need of the day. Their ecological dynamic analysis proves significance in the approach. It also shows the possibility of such a situation has better opportunity for adoption of natural or organic farming practices.

The policy issues are not identified the possibilities of such versions for the developmental activities. The kind of ecological history that small farms have over the development of the pre-colonial, colonial and the post colonial period offers a

better understanding. However the documents of these classics are interesting to consider the policy decisions for the future needs. But for the availability of these integrated analysis is nil or scarce. The present paper is one such attempts of comparative analysis of the ecological history in agrarian systems over these developments. Hence a grate deal of conservation of

these systems are in urgency. It has lot of regards to the extent that they have served for conservation. How to save the small farmers interest in the present trend of developments of free economy. Hence the ecological dynamics of traditional technologies offers a tremendous potential for our future understanding.

Agr-36

Moisture Utilisation in Kharif Cereals under Dryland Conditions

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In India about 143 m.ha area is situated under dryland conditions. The increased thrust in food production resulted in the cultivation of marginal, submarginal and wastelands. These areas consist 70% of the total land area and contribute about 45% to the food basket of the country. The major source of water supply i.e.300 m.ha.m.(75%) to aerable crop within short span of about 70 days, June to September. Under such conditions, growing short duration varieties of bajra, sorghum, maize and forage legumes will prove most beneficial practices of crop production in these areas, so that we have to follow the recent developed technologies on the farmers fields (i) If the

monsoon delayed upto the end of July than transplanting of bajra was found most suitable rather than direct seeding, ii) Paired rows of cereals. Bajra jowar Maize at 30 cm and legumes such as cowpea, guar, soybean, moong urd in the interspaces of 70 cm gave 30% additional yield, iii) Tillage depth to be maintained upto 20-30 cm with a deep ploughing followed by disc harrowing (iv) organic soil amendment/mulching to conserve the moisture and increase moisture use efficiency (v) Ridge and furrow or banded seed bed gave better results in almost all kharif crops.

Agr-37

Promotion of Sustainable Farming Systems and Community based Approach

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Kerala has been a state of vast genetic diversity and holds a large area under vegetative cover. The shift to monocropping of rubber, from the traditional multicropping system is one of the reasons for the state to become dependent on its neighbouring states for its rising food needs.

Thus, the food security of the state is being undermined by the rapid shift to the non food commercial crop, the Natural Rubber simultaneously with the disappearance of rice and vegetable cultivation from the state's fertile belt.

To alleviate some of the problems consequent to the above scenario the R&D Centre evolved a community based participatory agro-development programme to initiate and catalyse the shift towards a rubber based sustainable farming system. The project sought to remedy the environmental and socio economic problems associated with monocropping of rubber by enlightening and empowering the local community action with technical assistance/support from the R&D centre. The programme aimed at improving the living standards of the rural folks sustainably by inducing them to develop on their own a

self-sufficient system of Rubber based farming tailored to individual needs. It was laid out to provide an alternative livelihood strategy for the small rubber growers.

The programme was triggered primarily by sensitising the communities to the various rising issues of environmental and health hazards resulting from the intensive conventional farming systems. The possible alternatives/techniques and the need for environmental friendly farming were highlighted through a series of workshops and through the media. A voluntary committee consisting of leaders of local co-operatives, farmer associations and local government officials was formed. The development of local leadership further supported and promoted the project ensuring further development and continuity, thereby effecting real change in the farming to a more eco-friendly one.

The paper highlights the method of implementation channelised through local committee/leadership in employing a community based sustainable farming system in rubber plantations among the small growers of Kerala.

Traditional Method of Areca Nut Curing in Meghalaya

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Introduction

Area nut (*Areca catechu*) is popularly known in India as Supari and Shrivardhani. It is named as Kwai in Meghalaya. It thrives in the area owing to heavy rainfall and good drainage. The areca nut is a shade loving plant. Meghalaya suits the tree due to its high rainfall (3000 mm), steep slopes take care of drainage and clouds provide enough shade for its luxuriant growth. There is around 6200 hectare area under nut cultivation, which yields around 4200-5900 tonnes of production every year in the state (Anonymous 1982, 1985)

Areca nut is consumed in different manners right from fresh nut to cured nut and dried and flavoured nut. The nut is chewed with betel leaf and lime. People of Meghalaya are fond of taking fresh fruit instead of processed products. The fresh fruit first shelled with knife and then cut into four pieces. Such one piece is chewed with lime and betel leaf, and relished by the Khasi tribe of Meghalaya. But round the year fresh fruits are not available as the harvesting periods in the state are from November to December and March to April.

Curing of Areca nut

It is an age old practice to store the areca nut either under the ground or in the water. The fully mature fruits fetch the immediate market, whereas slightly immature fruits are cured to improved their quality. The Khasi tribe performs the areca nut curing in the flowing water. The technique might have been developed by the way of trial and error. In early age, individual tribe family used to store the areca nut in earthen pot of water for maintaining its moisture and freshness. The water used to be changed every week. Now the community scale curing of areca nut is practiced in the Ri-War area of Meghalaya (near cherrapunjee). A typical curing for areca nut consists of the following components;

- (a) Curing pond
- (b) Water flowing channels
- (c) Holding basket
- (d) Raising basket

These components and the method of curing areca nuts will be discussed in detail during the presentation.

Traditional Dairy Products and Technologies in Mathura District of Uttar Pradesh

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The importance of milk and milk products in human food has been recognized since Vedic time in India. There are variety of ways of preparing different milk products from available milk and has been developed more or less as an art and for many as a source of livelihood. This indigenous art or knowledge system of rural people is acquired either by an individual or a group of individuals through accumulated experience, informal experimentation and intimate understanding of the environment in dealing with situation and problems in processing and preparing milk products independently or collectively in a specified area. Such knowledge and practice is an entity in itself, special to a particular, culture, society, codified in the local language and changes through indigenous mechanism of creativity as well as through contact with other local knowledge system.

The rural people of Mathura district of Uttar Pradesh have been

deligent in carrying out experiment of making different milk products which are quite popular and are commonly consumed in surrounding and distant area too. Not only mythological descriptions but also historical evidences at test a vast reservoir of this wisdom and creativity of these people in preparing and processing milk and milk products such as Mathuro Ka Peda, Khurchan, Mohan Bhog, Raj Bhog, Mohan Kheer, Sohan Halwa, Chenna Mithai, Rasmalai, Gujhia, Ravari, Ghewar, Makhan and so on. Attempts have been made to study the actual process perfectly refining techniques those an widely used by the people of this region and also knowing their scientific rationale behind continuing these technologies of making milk product. An inventory of different milk product. An inventory of different milk product locally prepared is made which also include a brief account of its process.

Effect of Organic Manures and Methods of Nitrogen Application on the Growth, Yield and Quality of Ginger (*Zingiber officinale*)

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To see the effect of various organic manures and different methods of nitrogen application on the growth, yield and quality of local cultivar of Nagaland ginger, an experiment was conducted on the experimental farm of School of agricultural sciences & Rural Development, North-Eastern Hill University, Medziphema, Nagaland during the year 1993. The soil of the experimental site was deep sandy loam with pH 5.3. The treatments consisted of organic manures like FYM, Piggery and poultry manure at the rate of 10 tonnes per hectare and nitrogen at the rate of 80 Kg/ha in various split doses. The homogeneous and healthy planting material (rhizomes bits) of 20-25 gm weight were planted at the spacing of 25 x 30 cm. Organic manures were applied three weeks before planting whereas nitrogen were given at basal dose as well as top dressing according to treatments. Data were recorded on different growth characters on 60th, 90th, 150th and 180th days of the growing season of the crops. At the time of harvesting, rhizome weight per plant, yield per plot and yield per ha. were also recorded. Fresh ginger oil and dry ginger oleoresin content were also found out.

It is evident from the result of the experiment that different sources of organic manures and methods of nitrogen application had an appreciable impact in lathering the growth attributes. Height of plant and number of tillers per plant increased significantly by application of piggery manure over FYM and poultry manure. The influence of FYM was better than poultry manure with regard to height of plant and number of tillers. Different methods of nitrogen application were found to be effective the height of plant. The maximum plant height (70.6 cm) were recorded when 1/2 nitrogen were applied at the time of planting and 1/2 nitrogen 30 days after planting. Among the

different treatments, piggery manures (10+/ha) and half dose of nitrogen at the time of planting and half dose 30 days after planting was found better in increasing the height of plant, number of tillers and number of leaves.

Piggery manures produced maximum yield per plant, per plot and per hectare, which was significantly superior over FYM and poultry manure. Methods of nitrogen application did not influence the yield attributes significantly though maximum yield per plant, per plot as well as per ha. was recorded with half dose and half top dressing. Maximum yield was recorded with piggery manure and half dose of nitrogen at the time of planting and half dose 30 days after planting.

The highest oil (80.37) and oleoresin content (948.12) percentage were recorded with poultry manures whereas maximum oil and oleoresin yield was 80.73 lit/ha and 1309.07 lit/ha respectively with piggery manure. The different method of nitrogen application failed to cause any significant effect on quality of ginger, however maximum oil and oleoresin yield was recorded with basal and half top dressing of nitrogen. Application of piggery manure caused maximum accumulation of nitrogen (1.56 g/plant) as well as per ha (73.89 Kg/ha). Piggery and poultry manure were equally effective in increasing the accumulation of potassium in leaves and rhisome of ginger (0.84 g/plant) and impact was significant over FYM.

The maximum uptake of potassium was also observed with piggery manure. Phosphorus uptake was not influenced significantly, however maximum accumulation and uptake were noticed with poultry manure. Different method of nitrogen application did not influence the uptake of N, P & K.

Livelihood Strategies and Innovative Indigenous Agricultural Practices of a Tribal Community - A case study of siddi tribes

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Meaning of Indigenous agriculture is not limited to a village or to a locality. Focus of indigenous agriculture in universal in dimension and aiming more at the principles and resources of the given locality. The word indigenous would also imply that which is something special or unique. Indigenous knowledge, indigenous resources, indigenous practices...so many

synonyms have come about to explain to the world that they have something to contribute.

Green revolution was blamed for the loss of genetic diversity, water pollution, pest outbreaks and so on. But the unseen part of green revolution is the erosion of village knowledge base, various agriculture rituals, village health and so on. so far

indigenous knowledge has been looked as useless and unscientific. So called scientific community hasn't even today understood the rationale behind village thinking. All those rational and logical information become scientific to us as the visions are complete. Threatening experience has already been observed by neglecting or withdrawing our attention from the socio and cultural visions and aspirations of our forefathers.

Under the shadow of green revolution we couldn't see the farsighted vision of our great grand fathers. Ecologically sound and economically viable agricultural package given by our ancestors is under the verge of extinction. Because of the extensive expansion of metropolitan thinking into the villages has made the situation even worse. When the whole village is converted into cities for dwelling purpose, we can't just imagine the magnitude of loss in terms of seeds, 'craft man ship', knowledge attached to agriculture and above all the practical idealism (Biggest natural wealth of most of our villages).

Local thought may be from a spiritualist or from a farmer, have always been respected and practiced in ancient days.

Seeds sowing, plants transplanting, plant harvesting was in tune with the cycles of moon. Most of the agricultural rituals will go with the moon cycles and all those rituals will have their own say towards plant protection. Cosmic influence on plant, even though benefits have been reaped by farmers, it has been

neglected and rejected as foolish and unscientific thinking. One must understand clearly that diffusing any information into the village is not an easy task. Farmer always sees the cost-benefit ratios after that only he looks at the technology that we are interested in.

When this being the situation we must carefully see and examine, why our farmers practices still attached to planetary movements? (These informations look funny externally but as we go deep, investigating the roots of some of the planetary practices, we would really appreciate the broad based vision set by our ancestors).

SIDDI - a tribal community seen along the coastal line of Uttara Kannada district of Karnataka. Some author's say that Siddi means a slave. May be this is true because this community was expected to have come to India through Portuguese as slaves. Today, siddis have become one of our indigenous wealth. Even today, their attachment to big cities or town is not seen. They live in forests, respect the plants they use as God and Goddess, cultivate the land with due reverence to the mother earth, sow crops according to planetary movements, maintains diversity even in monocropping pattern as a survival strategy, ploughs in the traditional knowledge in order to increase the fertility status of soil and so on.

Agr-42 Views, Methods, Experiences & Concept of Dryland

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I come from Dharwad districts of North Karnataka which is a famous education centre as well as Tawar Roti Red chillies powder, and Brinjal Bhaji as major food items.

I am, a down to earth farmer, practicing organic farming since 8 years. Before switching over to organics I was a very good chemical farmer from 1972-1987. Thanks a lot to chemicals which made me to switch over to organics. As I am from an agricultural family and took farming at that time (1972) when the trumpets of Green Revolution were at its peak. So I fully embraced the Green Revolution programmes, and the miracles of it were viable, sustainable, in the beginning years.

I did work so hard to get more yields dumping more & more

chemicals according to package of practices went on to grow only cash crops and that to monocrops. I doubt whether the people of dept. of Agriculture has done or not according to their recommendations. To get more money through good harvest, chemicals were needed extensively after 12 years of chemical farming with crops were like T.B patient, and on need of injection of fertilizers and pesticides.

Realization of Big Harvest also meant a big expense. While the Gross Profit was more a sin of the Net Profit was decreasing year by year. I realised the Myth of Green Revolution and was compelled to turn for organic farming. In this paper I will deal with my experiences of Dryland organic farming.

Agr-43 Philosophy and Practical Guidelines for Organic Farming

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Natural or organic farming is not a new imagination. It has been practised since several generations. To this practice, came the chemicalised agriculture as an alternative farm of practice. Since the farmers who got scared of serious negative effects of green revolution have now started giving

attention to the traditional agricultural practices, the new expressions such as natural farming or organic farming have also come into vogue.

Today, world over, there is an increased concern to weigh the

pros and cons of every activity. Which methods or practices if used would help to prevent the environmental destruction? or which of these would help avoid ill consequences on the health of human beings? Or how to cultivate with low external resources? These are some of the questions which are emerging in the minds of people.

Availability and use of resources, avoidability of increasing cost of agriculture, improvement in the quality of food produces and so on are now gaining more importance than earlier.

The feasibility or the non-feasibility of these new orientations are also being increasingly examined nowadays.

Organic farming does not cause any harm to the environment. This system of farming is socially justified. In this, man, animal, plants are positively interrelated. It is easy to practise the organic way of farming. For this practice, the resources are locally available.

In this paper the philosophy and practical guidelines for organic farming based on my experiences are given.

Agr-44 Farmer's Knowledge of Monsoon based on the Ancient and Traditional Technology

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70% of the country's Agriculture is rainfed. Ancient meteorology was based on the works of Varaha Mihira and the other sages. The originals were in Sanskrit. Later this knowledge was rendered to the public in the common language by later sages by the medium of verse, proverbs and idioms. The farmer's Almanac was complete with forecasts of monsoon winds and monsoon. Also the behaviours of animals in heralding different

weather conditions has come to be recognised. Even the plants and trees act as guides.

On the other hand, the modern meteorology with its super computer satellites is a very costly affair. The ancient wisdom coming as it does, fool proof and time tested, should be formally adapted.

Agr-45 Seasonality Analysis for Fodder Management

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Animal draught power is the only arm power available to the farmers of hill agriculture and arranging a regular supply of fodder-dry, green or any supplement throughout the year assumes great significance. Usually farmers grow seasonal fodder crops like sorghum, maize, cowpea, berseem, oats, etc. to supply green fodder for their cattle, collect green grass from hill slopes during monsoon and supplement with fodder leaves from trees in other seasons. In addition, farmers also keep stocks of wheat straw and paddy straw to supplement the green fodder for their cattle. Farmers manage to supply fodder in all seasons, though not in adequate quantities, to overcome scarcity of fodder in some seasons.

A New Technique

Seasonality Analysis is a new technique of participatory rural appraisal which allows to get a total view of the seasonal variation in the village. This technique can be used to get information on problems of seasonal nature - works, employment, labour scarcity, credit availability, rainfall, agricultural operations and other issues with seasonal variation. This technique helps get an insight into the seasonal variations in a number of parameters relevant to farmer's lives. This tech-

nique also gets a list of priorities which would help in developing a village natural resource management plan and also to take corrective measures of avert acute shortages of farm inputs labour, food, fodder, fuelwood, etc.

Fodder Management

Using the Seasonality Analysis technique we could easily look at a full year with all seasons on all aspects of fodder-sources of fodder, availability, quantities of fodder, scarcity of fodder, lean seasons, busy seasons and seasonal patterns etc.

An empirical study of the fodder management practices by farmers and farm women of the hill regions has been undertaken using this seasonality analysis technique and the results are presented using graphics. In the seasonality analysis, an attempt has been made to determine the seasonal calendar, usually lunar calendar as understood and practised by the villagers.

Seasonality Analysis technique can also be used in other contexts where a comprehensive information can be got quickly for use in action research projects or other such development projects.

Agr-46 Ethnoveterinary Practices - Farmer's belief and Scientist's Rationale

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Some of the traditional animal health care practices were documented by interviewing the farmers of Bankura district (W.B.) by adopting stratified random sampling method with the help of unstructured schedule. A list of selected traditional practices was mailed to 60 experts/scientists and practicing veterinarians. Their responses were recorded on a three point validity continuum (scientifically valid, can't say and not valid category). The weightage for these categories are 5,3 and 1 respectively. The extent of adoption of these practices were also ascertained by interviewing 116 farmers with structured schedule. Based on the frequency of adoption and validity score assigned by scientists 20 health care practices were short listed. The practices make use of locally available herbs and other products with virtually no side effects. Farmer's belief and scientists' rationale on the selected practices are discussed.

In case of tympany administering a mixture of onion 500 gm, molasses 250 gms, black salt 25 gm, soda 25 gm or a mixture of onion 500 gm, ajwain 25 gm, black salt 25 gm, ground and poured in 1 liter of water and then drenched. This is considered to be valid by 80 per cent of scientists.

The scientists of Indian Herbs indicated that a dose of 250 gm of onion is sufficient in the above mixture. That ajwain, black salt have a role in the digestion, is mentioned by some scientists.

A mixture of 25 gm each of ajwain, kalijera, black salt, common salt and ginger is made into four equal parts. One such dose is administered daily. Nearly all the respondents were

using this on a cure of indigestion of animals. A good majority of scientists also have found it valid. According to one scientist it acts as ruminotonic.

Deep wounds are washed with boiled neem leaves before applying medicine. Farmers believe that the decoction of neem leaves kill the germs present in the wound. Seventy six per cent scientists considered it as a valid one. According to them it acts as an antiseptic.

Turmeric powder and deshi ghee in equal proportions are mixed and heated to form paste which is applied on the abscess for treatment. Some of the farmers explained that this paste facilitated early bursting of abscess and discharging of puss. According to one Physiologist turmeric is a disinfectant and ghee is an emolient. Indian Herbs maintained that the paste is effective provided it is applied in warm condition.

While legitimizing indigenous knowledge and encouraging farmers to use it something more than the understanding technical bits are needed.

According to Last and Chavunduka (1988) there is an inherent danger that traditional medical knowledge will be defined in terms of technical herbal expertise that this experience in turn be recognised only for its imperial pharmacognosy, without reference to the symbolic and ritual matrix in which these rituals and symbols have meaning. Simply to collect the technically useful items of local knowledge in scientized package will tend to devalue it.

Agr-47 Alternative Approaches in Soil Conservation Extension for Gaining Farmer's Participation: Integration of Indigenous Knowledge

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The growing concern for the rich sources of indigenous technical know-how and traditional wisdom should logically lead to their meaningful consumption and assimilation into the main stream of systematic and scientific process of technical knowledge generation. The process of integration entails a to-and-fro approach between land and land for which all the three systems: The research, the extension and the clientele (farmers) systems need be geared to jointly perform the task.

Several alternative approaches have been suggested by PSR researchers working on different paradigms. Integration of indigenous knowledge of the farmers and farmer-to-farmer extension is one such alternative approach for soil conservation

extension. The issues involved in integration of traditional knowledge system are dependent on on-farm resources, concern for environment, emphasis on location specificity of technology, documentation and verification of traditional technologies, process of knowledge generation (reductionism versus holism), specialist versus problem solving approach, adoption behaviours of farmers, stereotypes and prejudices held by scientists, issue of ethnocentrism - both for research and clientele (farmer) systems, changes in work climate of research organizations, feedback from land to lab, and finally shifts in research policies towards location-specific low-cost technologies and resource conservation etc.

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The growing concern for the rich sources of indigenous technical know-how and traditional wisdom should logically lead to their meaningful consumption and assimilation into the main stream of systematic and scientific process of technical knowledge generation. The process of integration entails a to-and-fro approach between lab and land for which all the three systems: the research, the extension and the clientele (farmers) systems need be geared to jointly perform the task. Unfortunately, the traditional wisdom has been denied its due place in modern developmental efforts since they were thought of as belonging to ancient history, non-scientific and nothing substantial to offer. The issues involved in integration of

traditional knowledge system are dependent on on-farm resources, concern for environment, emphasis on location specificity of technology, documentation and verification of traditional technologies, process of knowledge generation (reductionism versus holism), specialist versus problem-solving approach, adoption behaviour of farmers, stereotypes and prejudices held by scientists, issue of ethnocentrism - both for research and clientele (farmer) systems, changes in work climate of research organizations, feedback from land to lab and finally shifts in research policies towards location-specific low-cost technologies and resource conservation etc.

Strategy for Incorporating Indigenous Technological Knowledge in Agricultural Research and Extension Net Work - A Model for Eastern Ghat High Land Zone of Orissa

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The social and economic life of Indians remained devitalised for millenniums under a Grand Alliance under which various social groups worked as partners in production, procurement and supplies, conversion, assembly, finishing, logistic and distribution and sales, after sales service. This uniquely integrated socio-economic structure was developed and was established when the Indian society achieved a fully developed fallahadom, having elaborate forward and backward linkages in a highly decentralised and a widely dispersed production system with agriculture at the apex and animal husbandry and fisheries as its allies. Each Indian hamlet was in fact, a production-cum-training centre and numerous such hamlets were woven up into the country's macro-economic structure. The knowledge, wisdom and the technology which supported and sustained such a grandiose plan for thousand of years undeniably lay immersed in the daily life of the people and cannot be washed away much less swamped out by the modern production and distribution system which cannot claim more than a couple of hundred years as its history.

Researcher and extension functionaries overlooked this Indian panorama and have not often considered the relevance of farmer's knowledge as handed down from generation to generation. The extension service could play an important role in identifying such knowledge. Considering farmers as significant partners in production, the extension management needs some flexibility in order to facilitate the transfer and transplantation of farmers knowledge in research and extension network. Farmers concept of soil, climate, plant parasites and

diseases etc. could be a basis for such symbiosis. Researcher could identify some farmers technologies to test and to improve before pressing the same into the extension service. To this, end, they may use the extension service for the necessary feedback by way of indentifying farmer's technologies instead of using this service as a mechanical conveyor of modern knowledge.

Being aware about the importance of indigenous knowledge which is abound in the eastern ghat highland zone the author visualises the possible exploitation by way of developing suitable strategy and a working model for incorporating indigenous technological knowledge in agricultural research and extension network of the zone with suggestion for overcoming as revealed from the existing (i) social, (ii) psychological, (iii) resource related, (iv) infrastructure, (v) promotional, (vi) communicational, (vii) technical, and (viii) polical constraints for such integration through following actions, viz.

1. Establishing a centre for indigenous knowledge
2. Giving curriculum sanction for indigenous knowledge
3. Having a broad based extension approach
4. Framing appropriate policy
5. Seeking support from general academia
6. Involving NGOs
7. Giving wide publicity

Reckoning with the pre-requisites, outlined by him as measure of overcoming the perceptible constraints of incorporating

indigenous technological knowledge, the author has conceptualised a model basing on the well known Training and Visit (T & V) system of agriculture extension. The model incorporates indigenous technological knowledge into the existing agricultural research and extension network of the study zone under ideal condition

While developing this model, following questions have been kept in view. Where, when, how and by whom the existing indigenous knowledge of the zone

a) can be identified and collected,

b) can be validated or assessed rationally and scientifically, and

c) can be communicated or disseminated.

The various activities undertaken through the system of this model are grouped under two stages, viz. (1) Identification stage and (2) Assessment and recommendation stage, where the system of functioning of the model relating to different activities is explained.

Agr-50 Traditional Knowledge in Agro-Technology Generation and use

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Traditional wisdom/Knowledge which forms the base for a social system when codified properly facilitates communication and decision making. This, as unique feature of a given society or culture is changing in nature through indigenous creativity and innovativeness as well as by means of contact with over systems knowledge/wisdom. This indigenous knowledge systems (IKS) obviously is the sum total knowledge and practices which is again based on experience of people in dealing with situations and problems.

Admittedly, roles of farmers in the process of technology evolution, adaptation and dissemination is increasingly being felt. This is quite evident in the models like operational research project, Lab to Land Programmes through KVKs, farming systems research and participatory action research. In this paper, author has put forth strong arguments in use of traditional wisdom/knowledge systems (in agriculture and allied sectors) for evolving ecologically pragmatic and environmental friendly technologies. Even micro level planning under different farming situations needs to start from below and from fields with active and effective involvement of farmers, extension personnel and scientists. Hence, farmers act as co-researchers and they actually plan for the scientific farming situations. The basic philosophy, approach and methods are based on the concept of Participatory Rural Appraisal (PRA).

For this purpose, author firstly has stressed the need for ecological mapping for targeting of technology needs of different consumer classes and niches also to demarcate pockets of different crops and their varieties under rainfed and irrigated situation. Such mapping is to be done at village, block and district level. With all these types of data base one can find effective alternative for locating the trials and demonstrations of potential technologies. Secondly, method of manual discriminant analysis for drawing farmer's own innovative genius has been advocated. This technique will enable in generating hypotheses responsible for the variability in farming practices in the same micro-ecological region/area and isolating the contribution of ecological factors from that of socio-economic factors. Thirdly building upon local knowledge/wisdom may be at the level of grass users/farmers. This knowledge pools are to be transferred back to the scientists for experimental validation, modification and eventual diffusion. Tendency continues to be from Lab-to-Land in the Indian

scenario. This ought to be transformed into Land-to-Lab-to-Land model. Obviously, need is to have and practice Farmer-first-farmer-last model or Farmer-back-to-farmer model in the full benefits of cross bred and the exotic cows could not be realised as these animals have not adapted to the local Indian conditions due to certain limitations. On the other hand, buffalo has successfully withstood the onslaught of exotic and cross bred cows in spite of big Government support to promote these animals. Presently out of the two major milk producing species, namely, buffaloes and cows, buffalo seems to have an edge over cows because of its higher yield potential and people's having distinct preference for its milk. At present bovine stock count for 66.30 percent of the total milch live stock animals in Punjab, which included bovine and cattle. Thus, there is a reason to explore the factors which had brought the population of buffaloes to form a major segment of milk producing livestock in this agriculturally most advanced state of India.

The endeavour in the present paper would be to

- i) study the growth in cows (both local and cross bred) and buffaloes over time,
- ii) identify the factors due to which, buffalo - the traditional animal has survived the onslaught of cross bred/exotic cows.
- iii) study the important parameters which may help this species to gain advantage over its competing species.

In addition to this, efforts would be made to examine the factors which need further research, keeping above all the interests of the nation, towards fulfilling the future demand of dairy products under the given resource constraints of the Indian economy.

To achieve the objectives of the study both primary as well as secondary data will be collected from various sources, like Directorate of Animal Husbandry, milk plants in public/private sector etc. in Punjab. Suitable statistical techniques would be used as and where required to reflect the significance of the findings.

Forestry

Forest Structure Vis-a-vis Management: Vigorous Protection Vs. Villagers Interference (Marakkanam R.F)

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In the two case studies presented here an attempt is made to compare a protected tropical dry ecosystem (declared a Tiger Reserve two decades ago) with a degraded *forest* ecosystem (bereft of timber trees and once marked for conversion to plantation) in which the villagers have certain rights.

Because the scrub-woodland of Coromandel coast did not contain timber species, the forest management practice in 1960s and 1970s was to convert them into plantations. Thus in 1976, there was a plan to clear fell the Marakkanam RF but at the request of the French Institute, Pondicherry and other NGOs, the Forest Department decided to leave it standing for the conservation of biodiversity given that such scrub-wood lands with their exclusive flora were indeed rare in the Coromandel region and elsewhere.

Surrounded by a relatively high density of population in the nearby villages, the scrub-woodland and its degraded stage thicket serve as the only source of fuelwood and medicinal plants for the villagers, who exploit these resources at a reasonable rate, not allowing the formation to perish, realising that this RF is their only source for fuelwood and other needs.

It may be suggested that alternative energy plantations with fast growing species around the villages, would give a chance to the thickets to evolve further towards the scrub-woodland stage and eventually to the forest physiognomy.

A good example of land development is available at Auroville, a township near Marakkanam and Pondicherry. It was almost a barren, subdesertic area with ferrallitic soils with poor yields of millets. It is a *green* area today thanks to the afforestation programmes launched by the earlier settlers in Auroville. Plantations of fast-growing hardy exotics like *Acacia auriculaeformis*, *A. mangium*, *A. holosericea* and *Eucalyptus* (hybrid) coupled with soil conservation measures made conditions favourable for the growth of the indigenous species of even humid zones like the Western Ghats. *Acacia auriculaeformis* which was once used as a fuelwood species is today in demand for making furniture there being a ban on felling of forest trees. It fetches as much as Rs.350/- per cubic feet.

It would be worth considering plantations of these species in the Marakkanam region and its vicinity to help solve the fuelwood shortage, to relieve the pressure on the scrub-wood

land/thicket for the supply of firewood and to generate some additional income for the villagers.

The Ministry of Environment and Forest, New Delhi, had plans to hand over the management of the degraded forests to the industries (Indian Express of 12.1.1995). However, noted environmentalists like Dr.M.S.Swaminathan pointed out that such a policy would hit the small and marginal farmers (Indian Express of 5.7.1995).

As to the Ainurmarigudi RF, in spite of strict protection, the density of trees is declining due to animals and fire; the latter may be natural or accidental. Establishment of Tiger Reserves in some cases faced opposition from villagers who had to be displaced. A violent incidence took place in recent years at the Nagarhole Tiger Reserve, not far from Ainurmarigudi, where burning of forest was resorted to..

The key to the proper management of Ainurmarigudi RF lies in regulating the frequency and intensity of fires so that the right proportion of trees and grasses is maintained to satisfy the needs of grazers and browsers and retaining the savanna-woodland status of the sanctuary.

Dead woody material and Minor Forest Produce collected under the control of the Forest Department may be placed at the disposal of villagers so that they do not feel alienated from what was once their domain. Elimination of dead material would help control the fires.

The lesson from these two examples is that protection does not necessarily mean progression towards a dense forest structure which is as well otherwise the savanna-woodland physiognomy would be upset; management in the form of fire control is required to keep the ecosystem in a state of equilibrium. On the other hand, when the villagers have an access to a *forest* with certain rights, it does not disappear altogether. The consciousness on the part of the villagers by limiting the extraction from it maintains its continuity, albeit in a state of degraded forest. By raising energy plantations of fast growing species in the vicinity of the villages, the dependence on the thickets for fuelwood would be reduced considerably giving the degraded vegetation a chance to restore itself to the physiognomy of a scrub-woodland.

Role of Trees in Traditional Rainfed Agriculture : A Case Study from Javadi Hills, Tamil Nadu

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Trees play a crucial role in marginal agricultural areas. Farmers are known to plant trees that are useful for fuel, fodder, fruits, timber and other uses. This paper is an attempt to document tree species that were either planted or allowed to grow and certain aspects of tree tenure in 5 villages of the Javadi hills, Tamil Nadu. The Javadi hills is located in 12 18' and 12 54' N and 79 35' and 79 11' E in the districts of North Arcot and Thiruvannamalai, Tamil Nadu. The tribals inhabiting the hills practice rainbased agriculture cultivating a number of millets, pulses, oilseeds and vegetables essentially for subsistence. The farms are also dotted with a number of trees. A transect was laid across farmlands in each of the five villages. At every 100 m, tree species, their GBH and approximate

height recorded. Interviews were conducted with 25 tribal farmers on the role these trees played in their lives.

A total of 31 species of trees were identified on farmlands in the five villages. Jack, Terminalia chebula, Tamarind, Mango and Ficus sp are most frequently encountered on farmlands. While Jack, Tamarind and Mango are raised in small numbers to be planted on farmlands, Ficus is allowed to grow naturally. Terminalia chebula saplings and bamboo are frequently brought from the nearby forests. Farmers make a rough estimate of the crown area against the productivity of the dryland before deciding to plant trees. Trees are regarded as property and are pledged lieu of fines and loans. The tree species are also so chosen that they provide employment during the lean agricultural periods.

Agroforestry in AID of Rainfed Agriculture

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Agroforestry systems are of vital importance especially for rainfed agriculture due to an assurance against risk management. Appropriate advanced agroforestry technologies can yield a wide range of products from the same piece of land. Agrisilviculture, agrohorticulture and alley cropping can guarantee the productivity even during drought periods. Planting multipurpose trees and fruit trees on farm and field boundaries are some technologies as available which have proved advantageous to provide additional bonus yields without much effect on the agricultural crops.

Agroforestry systems in addition to risk management under rainfed condition also provide purposeful gains in terms of soil productivity, soil and moisture conservation and above all saving the environment.

Under harsh climate agroforestry systems have provided shelter to the agricultural crops. Even played effective role in controlling the advancement of the deserts, etc.

Effective water saving devices like sprinklers, drip irrigation, etc. have helped in promoting agroforestry systems under rainfed agriculture.

Studies at NRCAF, Jhansi and elsewhere on agrosilviculture, agrohorticulture, alley cropping, block plantation, field boundary, farm forestry, etc. have resulted in demonstrating the effectiveness of the system under rainfed agriculture both for production as well as various service roles.

For-4 Seed Storage in some Forest Trees: Traditional and Modern Methods

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Seed plays a significant role in raising vigorous stands of any forest tree species. It is subjected to damage due to microflora on and inside the seed, and abiotic factors like humidity, temperature and drying at three varying environmental conditions, that is, during ripening process, storage and germination in soil.

Research work is scanty on the suitable methods for the protection of forestry seeds in storage and hence this evaluation on traditional and modern methods of seed protection in storage.

Seed longevity, by its genetic constitution itself, varies from species to species from few hours to more than 100 years. It

can physiologically deteriorate if affected during collection, processing and in the methods of storage thus affecting percentage of germination and the health of the seedlings.

Chemical dusting, slurry, liquid fixation and liquid treatment are but few modern methods involving varying insecticides and fungicides which are the most common modern methods, the impact being: about 3,00,000 Indian farmers lose their lives due to pesticide poisoning, imports Rs.800 crores worth of chemical pesticides, destroys natural vectors that help in pollination, provide natural vectors that help in pollination, provide natural protection against the insects and rodents. It is an important problem, according to WHO estimates, one of every two acres of cultivated land feeds insects and pests; India loses nearly Rs.5000 crores worth of agricultural products annually due to the ravages of pests, that is, nearly 18% of total food production.

New technologies are evolved to contain the indiscriminate use of chemical pesticides which are but only refinements of Indian traditional systems. As trees are becoming part of social components, relieved from the exclusive domain of Forestry, under agroforestry or ethnoforestry, it is necessary the eco-friendly botanical pesticides are identified, evaluated and applied to forest tree seeds in storage. A knowledge of the toxic plants, toxic principles and their biological activity is of paramount importance, to substitute or replace the toxic commercial chemical pesticides. Nearly 2000 flowering plant species are reported to possess insecticidal activity. There is no comprehensive list of such plants in India except few attempts since 1993.

Azadirachta indica, *Vitex negundo*, wood ash and cowdung were employed and the behaviour of the tree seeds of 30 species in storage have been evaluated and the results discussed. Some of the locally available plant species effective as botanical pesticides against specific problems are enumerated.

For-5

Rural Bihar and Social Forestry Programme A Sociological Analysis

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Bihar which constitutes about 5.3% of the total geographical area of the country has about 11% of its population. About 59 million of its population is tribal which constitute 10% of its total population; but occupies 46.8% of its geographical areas. This area constitutes the plateau of Chotanagpur and Santal Parganas.

It has to be remembered that of the total area of Chotanagpur and Santal Pargana roughly 45% is not available for cultivation and about 30%, is covered by forest, 70% is classified as barren and un-cultivable land.

Forest in Bihar has to sustain a large number of vanbasis (dwellers of Forest) tribal and non-tribals living in the Forest ecology by providing them food in lean period in the form of roots, fruits, tubers; flowers, number of medical plants, resin and many other things which the indigenous forest dwellers by habit draw from the forest surrounding. Thus the Government of Bihar have taken a policy decision to utilize institutional

finance for the development of forests. Which aims at clear felling mixed forests and sal section forests on potentially good site conditions and plant them up with fast growing timber and pulp wood species. With these objective the forest development Corporation has been constituted which if allowed to work will offer of employment to the local forest dwellers, tribals and others.

The social forestry programme in the State of Bihar is as a matter of fact in full swing from the year 1980. As many as 60 centres are being operated under the tribal sub-plan in the tribal areas of Bihar and has benefitted rural masses by regenerating the potentials of the ideal resources at their command. It is common feeling that social forestry programme is not a plan but a philosophy, a philosophy to make once own life prosperous by augmenting production on such plots who by force of circumstances and infertility used to remain follow.

For-6

Home Gardens of Kerala - A Case Study of Selected Homesteads of Karulai Village, Malapuram District, Kerala

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Homegardens are one of the oldest agroforestry practices, found particularly in the humid tropics, which are rich in species diversity, highly productive and sustainable. They are

composed of multi-storey, multi-purpose (MPT) tree/shrub/herb/grass combinations and thus are effective as natural forests at maintaining bio-diversity and preventing soil

erosion besides meeting the subsistence needs and commercial demands. This mixed species stand is also very effective in capturing solar energy and utilising soil nutrients. Some Nitrogen/Phosphorus fixing tree-microbe/fungus combinations significantly contribute to the soil nutrient pool.

Agroforestry is a collective name for land use systems and techniques where woody perennials (trees, shrubs, palms, bamboos etc.) are deliberately used on the same land management unit as agricultural crops/animals either in the same spatial arrangement or temporal sequence. Agroforestry is the first concrete concept that builds on a synthesis of most of the practical experiences and scientific knowledge acquired over the past decades of tropical agriculture, forestry, ecology, soil sciences and rural socio-economics. Our increasing understanding of the social and ecological aspects of the tropical environment and the frequent ecological backlashes of the 'green revolution' agriculture technologies and the improper forestry practices in the ecologically sensitive and socio-economically complex situations have led to the realization that alternative approach to land use management must be given a higher priority.

The present studies were conducted in Karulai Village, located in Nilambur block of Malapuram district, Kerala during January to July 1991. The village is bound on the eastern side by Karulai reserve forest and two perennial rivers flow through the village. The North-Eastern part of the Karulai reserve forests (Kovilakam forest) is included in the core zone of the Nilgiri Biosphere Reserve (NBR). Agriculture is the principal occupation and the main source of income. Major food crops

are rice, tapioca, banana, yam, taro and corm. Principal cash crops are coconut, rubber, cashew, areca nut and pepper. The settlement pattern is scattered homesteads with homegardens. Most farmers in the village are smallholders practicing intense subsistence homestead farming with the incorporation of some cash crops and livestock. Considerable amount of off-farm income in the form of remittance from Gulf countries is available to many families.

The study area belongs to the Malabar Highland or mountainous regions of Kerala. There are three main land form units, viz. interhill miniplains, interhill basins and flat alluvial terraces (river embankment) in the study area. The terrain is undulating and rolling with hillocks and narrow flat valley floors. The elevation is nearly 55-100 MSL. The area has a humid tropical climate with average annual rainfall (1984-1989) of 1968 mm with temperature ranging between 23 C to 34 C.

Ten homesteads were selected from different landforms, alluvial terraces (river banks), interhill miniplains and basins and in terms of proximity to the forest. Details were collected on soil quality, natural vegetation, land-use history, current land-use practices with special emphasis on homegardens - their diversity, stand geometry, density, availability of multi-purpose products, their seasonality and uses. Besides, various agroforestry niches were identified along with their ecological functions/economic utilities. The interaction and feed-back between the agroforestry components, viz. MPT species, agricultural/horticultural crops, livestock and humans were studied in detail.

For-7 **Ethnobotanical Pageantry from the Tribal World Amid Floral Diversity of Aravalli Ranges (India)**

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As one proceeds along the ethnobotanical trails, the shades and hues of the plant based beliefs and practices of the tribals - the children of the deciduous forests of Aravallis, vary with the changing flora and terrain.

A study of the material aspects reveal a myriad uses of plants in form of shelters, famine foods, techniques involving food and agriculture, riddance of pests and farm enemies, unabated fishing (hunting being on the wane due to scarce game), feats of indigenous technology involving great ingenuity especially in case of agriculture, irrigation and transport.

Equally picturesque is their cultural panorama. Bamboo serves the populace from the cradle to the grave. Species of *Salmalia*, *Boswellia*, *Mangifera* and *Syzygium* figure frequently in their ceremonies and festivals. The forest forms a playground for adult and child recreation and wooden musical instruments exist in a rich variety. Blossoming *Butea*, *Erythrina*, *Bauhinia* and *Salmalia* add colour to the otherwise monotonous landscape. Plant part products are freely used in ornaments,

cosmetics, tattooing, painting and decoration-both in form of materials and motifs. Songs and proverbs describing their lives are rich with plant references and praise. From them one can infer the dominant elements, their morphological peculiarities, knowledge of their growth and reproduction, their properties and utility. *Mahuri* liquor from *Madhuca* flowers and fruits is the chief intoxicant.

Through ages, as mute sentinels plants have served not only as revered totems of clans but also as gods and goddesses associated with myths, worship and taboo often enveloped with superstition leading to their conservation. Equally interesting are illegal timber exploitation ways.

Protecting from sun and rain, quenching their thirst and hunger, serving as striking landmarks, meteorological indicators, as agents for illumination in the night with lurking dangers - both supernatural and mundane - the forests continue to serve the cultures that have evolved within them. The purpose of this paper is to present a stock of these relationships.

Traditional Systems of Forest Grazing Practices Followed by Gujjars and their Social Conflicts in Siwalik Hills

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Nomadism and shifting cultivation practices are the traditional systems of the nomadic tribe adds dynamism and aspects of sustainable management to the forest vegetation. The sole occupation of Gujjars is the rearing of milch animals who keep large herds of buffaloes. Average herd size is of 20 animals of which one-third are lactating, the other one-third are dry and the rest young ones. Household size is around 16 persons with almost equal number of adults and children. The livestock health is poor. Production of milk on an average is 2.94 litres per animal per day as compared to an average of 10 litres in the region. The Gujjars follow traditional migratory routes to the high alpine grass lands starting in the month of April from Siwaliks and return only during the month of November. During their sojourn in the Siwaliks they construct temporary *deras* with the local material from the nearby forest which is allotted to them by the forest department. The gujjars pay a nominal fee to the forest department, depending on the total no of animals they keep. The tendency therefore is to register fewer animals than they actually have. This results in an higher pressure then expected on the forest resources for grazing/lopping.

The Gujjars follow a typical lifestyle of their own. Each family lives in isolated and independent hutment with their operational boundary for feeding their livestock, marked in consultation with the forest officials. Depending upon the herd size, the area of operation varies from one to three kms per family. Traditional tree management practices for lopping are followed where the growing tips are protected for regeneration. A major lopping operation is done every evening and the animals are left overnight in the fields to feed on the lopped material. Depending upon the herd size 7-8 trees are lopped

each day. Before the animals are taken back to the *dera* next morning light lopping is again done and the animals are milked around 10 a.m only once in a day. For the next day the animals are fed on the fresh loppings from a new lopping zone in the allotted area. During periods of fodder scarcity the grasses and forbes are cut and fed to the animals.

This traditional system of forest grazing management is now under pressure, because of social changes in the Northern frontiers where alpine grasses have shrunk in their area. The quality and the quantity of the biomass available at high altitude has deteriorated because of poor management. The animal population of the settled villages of the region has also increased. Gujjars find it difficult to satisfy the needs of grazing with scarcity of grazing resources. This has forced a change in their lifestyle. More and more Gujjars are being forced by the circumstances to settle permanently in the Siwalik hill ranges where the grazing resources are already under pressure because of high population density and fragile environment with heavy soil erosion. This change has caused social conflicts with the local people, forest department and the conservationists. Presently there is a demand to oust the Gujjars from the forest and settle them outside the part area. People's organisation on the other hand are demanding that the management of the forest be given to the Gujjars. Here is a case where traditional system of forest grazing management has led to social conflicts. Efforts are being made to map the natural resources in the region and recommend ways and means to meet the future demand both of the Gujjars and the settled population through integrated resource development on watershed basis and improve the adjoining wastelands with soil and water conservation measures.

For-9 An Alternative to Fuel Wood - Dhundhu (A smokeless Chullah)

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In ancient time, human being is mainly dependent on natural resources to meet their minimal requirements. In the process of development, man started becoming more civilized resulted into more demographic pressure and modernity in social system. These factors-demographic pressure and modernity has forced to man for overconsumption of natural resources and resulted in ecological imbalance. However the man is rational and used to do experimentation with flora and fauna. This informal experimentation and creativity has enabled them to find appropriate alternative.

Since the time immemorial, the plants were used as fuel wood, timber and so on. But over uses of jungle wood has resulted into acute shortage of fuel wood. This acute shortage of fuel wood forced man to search out new best alternative to fuel wood suited to local conditions.

Such an attempt has been made in the present paper. *Tharu* - a tribe of North India inhabiting in Nainital district of Uttar Pradesh depends upon forest for fuel wood. The acute shortage of fuel wood and resultant high price leads to the practice of burning to crop residues like wheat straw instead of fuel wood.

For this purpose, tharu tribal people has invented a special type smokeless chullah locally called *Dhundhu*.

This chullah (Dhundhu) is economic, easy to construct, less time consuming, conserves more heat and produces negligible amount of smoke.

The present paper describes and discusses about the working principle of chullah, construction material, method of construction, cost of construction, its benefits over general chullah.

For-10 **Agroforestry : An Approach to Eco- friendly and Sustainable Production technology from North Eastern Hill Region**

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The North-Eastern Hill (NEH) Region of India, comprising the states of Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland and Tripura, lies between 21 51' and 29 30'N latitudes and 88 20' and 97 25' E longitudes. The vast area of hills interspersed with fertile valleys represents agroclimate of unique diversity ranging from extreme temperate to typical tropical. Coupled with this is the abundance of natural water source, high annual precipitation (750 mm to 11,000 mm and above), deep alluvial loamy soils, which combine to permit growing of wide variety of crops and fruit plants. However, the prevalence of shifting cultivation has resulted in environmental degradation as traditional systems of food production still continue to be the main occupation of about 4,43,336 tribal families in the region bringing in about 386.5 thousand hectares of area annually under this practice. Forest and grasslands whose existence is so vital for agriculture, have been undergoing fast degradation owing to deforestation caused by shifting cultivation and other human disturbances in the entire region. Fortunately, there exist some excellent sustainable indigenous land use systems and practices developed over a period of time by tribal people through their skill and local materials. The estimated annual returns of Rs.18,000 to Rs.42,750 indicate the economic viability of these systems, which were influenced greatly by site characteristics such as slope, soil depth and presence of physical hindrances. At the same time, agroforestry has a long tradition in north-eastern hill region, where trees are exploited extensively in the crop and livestock production systems. In a recent survey 37 agroforestry practices from different agroclimatic zones of the region were enumerated. These practices, except one are being maintained over a period of time in complete absence of chemical fertilizers and amelioratives under rainfed conditions, mainly due to addition of biomass (12-20 t/ha) from weeding, crop residue and litter which are completely recycled in situ and serve to conserve soil moisture and as a reservoir of nutrients. Few systems such

Zabo - an indigenous system practiced in Phek district of Nagaland has a combination of forest, agriculture, livestock and fisheries with well founded soil and water conservation base; bamboo drip irrigation system of Meghalaya for hilly terrains; and agriculture with alder, have stood the test of time and helped in resource conservation. Areca nut + black pepper + pineapple; areca nut + black pepper; and pineapple + mandarin orange in tropical hill and plain zone; Schima/Cinnamomum (tejpat) in sub-tropical hill zone, and plum with potato/cole crops in the temperate and sub-alpine zone were found most productive and promising agroforestry practices with unique fertility restoration capacity of soils. These systems need collective community efforts for common operations, it induces a sense of unity and discipline among the farmers and reflect community harmony for the preservation and maintenance of the systems. The systems are also good from the point of view of resource conservation and maintenance of ecological balance. However, in most of the cases farmer's share of the consumer price is hardly 20-30% and a large portion (41-54%) is taken away by the middlemen which could be changed by improving in transportation and establishment of cooperative societies in the villages. Besides, government could procure the produce directly from the farmers and sell it to consumers, so that farmers get good returns. Recently incidence of disease and pests have been noticed in few plantations of areca nut and betel vine, therefore, immediate attention should be given to monitor disease and pests incidence for assuring further sustainability of the systems. In fact, most of the systems and practices remained confined to the places of their origin, mainly due to inaccessible terrains. Hence, replication of these systems with scientific interventions under identical agroclimatic conditions will greatly help in increasing crop production and providing an alternative to shifting cultivation.

Forest Management and Indigenous People : Potential for Participation

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Forest management policies in India over the last two centuries have been directed at greater control by the State. The revenues earned from the forests go to the state treasury to be added to the common pool for national development and little trickles back to sustainable management of forest that provided the revenue. Successive forest policies have restricted local people's right of entry into reserved forests and has also limited the area and extent of village forest in which local communities exercise independent control. The Government has taken a strongly conservationist stand and imposed restrictions on the local people for the collection of NTFP's. Functionaries of the forest and revenue department view

conservation as *people versus forest* rather than *forests for the people*. This view eventually results in conflict between local artisans, forest guards, patvari's (Village Administrative officer) and policemen. These short sighted policies and concentration of power in the hands of forest and revenue department has resulted in inefficient forest management. This paper draws upon field discussions with indigenous people in the Kumaon Himalaya and traces the relationship between indigenous people and forests: impact of forest management policies and explains why it is essential to include indigenous people in forest management.

Role of Women in the Origin and Maintenance of Home Gardens

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Home gardens are repositories of plants. Women have traditionally played a significant role in the origin and maintenance of home gardens. Whether these gardens were solely meant to meet the daily food, fuel and medicinal needs of the family or while they were primarily serving the above purpose, they also contributed towards the aesthetic and cultural demands which have not been critically analysed. This is how-

ever rather difficult. One of the difficulties arises with the definition itself. The others may include such matters as describing the structure and functions of a typical home garden. Here we discuss a. the origins of home gardens b. structure and function c. contribution to in situ conservation of plant genetic diversity and d. reasons for their erosion. We also discuss the role of women in all these aspects.

Eco Institutional Perspective to Develop Tropical Forest Lessons from 'religious forestry' in India

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Conservation of forestry for religious purpose has been prevalent in many parts of south India. The maintenance of *Devera Kadu* (Forest of God) is one such unique example found mainly in Coorg district of Karnataka state. This has been rooted in religion and Indian mythology, but which ultimately is a perfect conservation measure. The *Devera Kadu* has a sanctum housing a god or goddess and an offering place. This has been surrounded by thick and biodiverse forestry, comprising of indigenous and religious tree species. There are 346 such *Devera Kadus* in the district, which vary from a bunch of few trees to around 150 acres of land. These are norms of protecting and sustaining the *Devera Kadu*, in which concern to preserve the rights of unborn generations and non-human beings is strongly rooted. These forests are maintained by the village community for both *existence* and *intrinsic* values. The

eco institutional perspective by emulating the cultural and religious norms followed in the conservation of *Devera Kadu* would help to develop the tropical forests in India. The logic of the eco institutional perspective follows from the access to ecological resource and use it. These depend on the assurance from the institutions (both formal and informal) which in turn, are reinforced by the cultural attitudes in the forms of beliefs and value system. Strong institutions can even correct weak policies and the institutional building process requires recognition of cultural and emotive dimensions of our living. Generation of internal command as against response to external demands requires sensitivity to values and personal beliefs which are predominant in the system of religious forests in India.

For-14 **Constraint in Agroforestry and Livestock Management on Watershed basis**

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Women play a vital role in integrated development of human kind and resources. The benefits of MPTS, aerable crops and new agricultural technologies may reach to the farmers by local adopters on their own fields and household practices. Lakara-karari watershed area initiated under the technical supervision of Indian Grassland and Fodder Research Institute,

Jhansi in 1986 on 2163.2 ha area on Jhansi-Gwalior Road about 12 km away from Jhansi main city.

The monetary status of the women is very low because of unemployment (100%) and the major constraint which is faced by the watershed women followed by other thirteen constraints as the major obstacles in crop production MPTS and livestock management as detailed.

For-15 **Indigenous Agroforestry: Emergence of Livelihood Securities in a Drought Prone Village in Tamil Nadu**

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Farmers in the semiarid tract of Madurai District (Tamil Nadu, State, India) particularly in Siddi Reddiapatti Village have developed an agroforestry system with *Azadirachta indica*. This agroforestry system has been developed and practiced by farmers over few decades. This indigenous agroforestry system copes with stress of saline water in open wells unfit for irrigation and recurring drought which affected crops, livestock and income. Long back few farmers were able to get substantial income by selling few grown up neem trees naturally grown in their fields. The high income derived by few farmers motivated others to find out ways and means of practising successful agroforestry system with neem. The success of agroforestry model is attributed to the choice of indigenous species to the block cotton soil and functional social institution which manages and protects large scale plantations. There are 189 families in the village and they belong to Reddiyar Community.

Farmers raise single crop in drylands during Purattasi pattam (September sowing season). Some farmers take double crops first sowing during Avanipattam (August sowing season) and second crop during Margazhipattam (December sowing). All the crops are being raised under rainfed conditions. Farmers sow cotton, red gram, black gram, green gram, cowpea, field bean, coriander, sunflower, ragi, varagu, Thenai, sorghum, bajra and usually mixed cropping is common.

Agroforestry System

Neem has been raised in 700 acres of lands. There are small population of tamarind (*Tamarindus indica*), Vagai (*Albizia*

lebbeck) and Karuval (*Acacia nilotica*). In between the trees dryland crops are raised. There is no strict spacing norms between the trees. However farmers believe that 35 trees per acre is ideal for making the ploughing operations smooth. This will also protect from excess shading which intum affect the yield of inter crops. Farmers usually cut the trees between 10th and 15th year depending upon their needs and also the girth of the tree.

Farmers put the weeds and dried twigs and wastes around the basal trunk of the trees as mulches.

Farmers prefer neem than tamarind or karuvel. Farmers have experienced that the growth of annual crops will be poor under the shade of Tamarind due to high heat. It is also difficult to plough the soil near the base of Tamarind tree due to hard soil pen. The growth of the crops under the karuvel will be poor when rainfall is not adequate leading to quick withering of crops. On the otherhand the crops are free from pest and diseases if grown under neem trees.

Farmers raise vegetables such as Bhendi (*Abelmoschus esculentus*) and Peerkkai (*Luffa cylindrica*). Peerkkai seeds are dibbled underneath the neem trees. The twine will naturally climb over the tree trunk and spread over within 2 months. Seeds will be dibbled during the month of Avani (August-September). Peerkkai can be harvested for 2 months during December-January. Yield of Peerkkai will be 20-30 pods per tree/twine. These vegetables are harvested by women for cooking for home consumption.

An Estimation of the Fuelwood and Fodder Dependence of the Villagers on the Ranthambhore National Park

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In 1973, Ranthambhore was selected as one of the first reserves under Project Tiger. It was provided the status of a National Park in 1980. Even though restrictions are grazing, collection of fuelwood and small timber from the area have been imposed, yet about 1.5 lakh people with a cattle population of nearly 46,000 cows and buffaloes, and around 25,000 sheep, goat and camel, is dependent on the Ranthambhore National Park (RNP) for its fuelwood, fodder and small timber needs. About 1 million migratory cattle pass through the area every year. The practice of agroforestry for supplementing their fuelwood, fodder and small timber needs is also not

prevalent in this region. This has posed a serious threat to the flora and fauna of the part and may result in degradation of the ecosystem of the park leading to loss of floral and faunal diversity. An attempt has been made in this paper to estimate the quantity of fuelwood and fodder requirement of people and livestock around the RNP. The findings reveal that about 45,737 tonnes of fuelwood and about 1,95,000 tonnes of fodder is used every year. These figures indicate the magnanimity of the problem and therefore, calls for immediate conservation action.

Importance of Trees in Ancient Agri-Religious Practices and Present Context

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Appropriate technology for increasing productivity of land and establishing crop production under tree plantation is known as agroforestry. It is a collective name for land use system in which woody trees, shrubs, including bamboo etc. are deliberately grown on the same land with herbaceous crops and/or animals, either in same form or in spatial arrangement of temporal sequence. In mixed farming system the farmers diversified needs are to be met with. Hence perennial trees are included with annual crops to have direct and indirect benefits like food, fuel, fodder, nutrient, fibre, timber wood, oxygen, wind breaks harbour wild life and improved micro-climate and annual crops which provide staple food to mankind so much so that the people of India have great religious sanctity to some of the tree species such as peepal (*Ficus religiosa*), Amla (*Embllica indica*), Sal (*Shorea robusta*), Kartam (*Adina cordifolia*) and sandalwood on the event of various festivals. Besides this, inclusion of tree species or on each and every traditional as well as cultural and social ceremonies such as marriage and other festivals is indicative of environmental conservation. The trees as well as crop products are utilized as basic ingredients for worship (Pur material) such as Mango, Khejri, Banana, Barley, Haladi and others as per local needs.

Long long ago, the Mahabodhi i.e. *Ficus religiosa* as a symbol of wisdom planted on about 84,000 places by Emperor Ashoka

the great ruler of India. He also sent his son *Mahendra* and daughter *Sanghmitra* with the sapling of the same tree species from India to Srilanka by which the message of Panchsheel (Buddhism) spreaded in most Asian countries. Therefore, the cutting of peepal (*Ficus religiosa*) is more sinful than killing of a saint. The planting of neem serves as village dispensary.

The introduction of silk in India from China by Buddhist monks is another example as farmers of Chhotanagpur, Santhal Pargana (Bihar), Agra (UP) and Mysore (Karnataka) regions are raising *Terminalia arjuna* and *Morus alba* plantation for silkworms. The lac cultivation on trees of *Sehleichers oleosa* (Kusum), *Butea monosperma* (Palas), *Zyzyphus jujuba* (Ber) is another example. Besides these, many tree species are in the existence due to their multipurpose uses, such as aromatic and medicinal values.

In the modern frontier Agro-technology, the forest wealth is being exploited for basic material needs such as food, feed, fibre, fertilizer, timber, clothing, shelters, medicines recreations and employment etc. The natural resources i.e wild gene, fertile soil, clean water is being gainful used in forest agriculture where activities of man have improved productivity of short terms enterprises. The mixed farming (Crop production and animal husbandry) therefore, save firmly rooted in physical environment for maintaining ecological balance.

For-18 People's Participation in the Conservation of Natural Resources
Case of (Devara kadu) Sacred Groves of Kodagu

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Most references to the conservation movement in India cite the instances of the *Chipko*, the *Silent valley*, *Sardar Sarovar of Narmada* and the *Bedthi* projects. The community participation in the conservation of sacred groves - Devara Kadu - temple forest or god's forest in Kodagu district, western ghats of Karnataka has been an institution with high survival value as the conservation has a great legacy. The village

community in a majority of the villages in Kodagu district has maintained at least one *Devara kadu* as a self imposed norm. The intention of this paper is to highlight this institution of *Devara kadu* (DK) and emphasize the role of the people's participation in providing social fencing for its survival and sustainability.

Water Management

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Mega-dams have become symbols of some of the worst ills of the prevailing paradigm of development. The structures which were once seen as the *temples* of modern India are now widely recognized to be counter-productive in social, ecological and economic terms. Mega-dams displace people, create a multiplicity of problems in the command area and also have a poor cost-benefit ratio, even in conventional economic terms. The debate on these various aspects has run parallel with many ground level struggles against such dams and a substantial amount of literature, of both activist and academic nature, has been generated in the process. Perhaps the most well-known and extensively documented of such struggles relates to the Narmada Valley Projects. The campaign spear-headed by the Narmada Bachao Andolan has elicited an unprecedented response from urban middle-class supporters and academics all over India and in different parts of the world.

However there is no significant shift in the thinking of policy makers. If certain mega-projects are in doubt, that is due to lack to funds. But in the present climate of increasing private (and foreign) investment in infra-structure of various sectors, many new mega-projects are coming up and shelved projects are being revived. The task of questioning and challenging such schemes is thus still in the initial stages and must be intensified manifold with a sense of urgency.

A wide range of perspectives is engaged in tackling this task. One view holds that all *mega* projects are inherently and inevitably destructive. Others argue that this may not be universally true and that in any case, size is not the primary issue. Some people believe that a combination of modern and traditional technologies can serve as an alternative to mega-projects within the prevailing paradigm. While some are convinced that without a basic change in patterns of consumption and concentration of resources, all *alternatives* amount to mere tinkering. Those who have worked closely on traditional water systems can well contest the very use of them *alternative* for people have been effectively living and producing by those practices for centuries.

The issue of mega-dams encompasses many of the challenges and dilemmas involved in questioning the prevailing concept of development and seeking other ways of living which can be viable for the expanding population of the planet. This issue thus also offers an opportunity to look at the modern vs. traditional debate in a wholistic sense — not merely at the level of technology (in the sense of specific techniques and methodology) but at the level of underlying principles, or worldviews.

Therefore, a discussion on the theme *Mega-dams and Traditional Wisdom Based Alternatives*, has been planned in the subject sessions under the Water section. The underlying assumptions of this discussion are:

The case against mega-dams need not be re-stated in this forum

There is a need to generate both popular consciousness about more socially and ecologically suitable alternatives and to convince the decision making mainstream about their viability in the present context;

This is primarily a political challenge relating to social justice and enquiry and secondarily a technical challenge;

This means effectively addressing the prevailing mind-set and engaging it in a dialogue about the urgent need for and possibilities for change;

There is a risk that the search for alternative may remain as alienated as the prevailing model and exclude the overwhelming majority of people from the process of making choices. Thus the search for alternatives may remain as alienated as the prevailing model and exclude the overwhelming majority of people from the process of making choices. Thus the search for alternatives must be simultaneously rigorous in the technical and theoretical aspects, and ensure ways of placing these debates in fora and media so as to inform and seek the involvement of a wide cross-section of society.

The session will focus on the following issues

Equity

The issue of water today cannot be addressed without first dealing with the question of equity in the most basic and broad terms. That is, if a powerful enough segment of society is determined to pursue patterns of production and growth which require high concentrations of water and energy, then can even the most effective watershed management and water-harvesting techniques cater to the needs of large factories and metropolitan centres?

Micro-Level Successes

Those who have worked on micro-level water management and storage will share their reflections on how these experiences contribute to the search for alternatives to mega-dams.

Engineers View

Several engineers have examined the Sardar Sarovar Project in detail and suggested damage-limiting alternatives. They will be requested to share their reflections on the interface between the modern and traditional techniques in seeking a wholesome alternative.

Lessons from Traditional Methods

What were the underlying premises and perspectives of the traditional systems, which were responsible for their innova-

tiveness and sustainability? Can this understanding help us in challenging and changing mind-set, and how?

Holy river, Dam(n)ed river

Water is an integral part of Hindu rituals and the grand perennial rivers are sacred. But why is it that the millions of people who take reverential baths in the rivers, are seemingly unmoved by the material plight of these water. What does this tell us about the continuity of certain facets of traditional beliefs and their intermingling with modern influences? Does this, and if so how, link

up with the striving for a wholistic regeneration of society?

This is a broad outline of the session and its details are open to modification. The purpose of the session is to examine the different ways in which the prevailing mind-set can be challenged. What are the scope and limitations of traditional systems and outlook playing a critical role in this process? This session is seen as part of on-going process of shared reflection which aims to involve not merely the 'converted' but also those who may not share these perspectives but are in positions of power as policy makers.

Wtr-2 The Relevance of Termite Mound as a Supplemental Tool to Electrical Resistivity Method for Locating Ground Water Occurrence in Hard Rock Terrain- A case study

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In Brihat Samhita, the ancient Indian scholar Varahamihira (A.D. 505-587) has provided an integrated account of diversified environmental between different plant species, animals and their physical environment. The 54th chapter, entitled *Dakargalam* (key to the water) having 125 slokas, is devoted mainly to the exploration of ground water in arid and semi-arid regions, by means of a number of bio-indicators viz; phreatophytes (well plants), termite mounds, morphologic and physiologic features of vegetation, aestivation, burrowing etc., In these slokas, Varahamihira has explained the distance, direction and occurrence of ground water table with respect to the position of phreatophytes and/or termite mounds. The relevance of one of these bio-indicators viz: termite mounds as indicators of ground water, has been verified during a field investigation carried out for selecting a open well site by employing the electrical resistivity method. The field survey has been carried out in a village called Settibettu (survey No.63/IAA3), in Udupi Taluk, Dakshina Kannada district, Karnataka. The area is situated on the hard crystalline rock of granitic gneiss overlain by laterite and lateritic soils. The rocks in this region have high apparent resistivity values and show poor resolution of apparent resistivity curves. The area is facing shortages of water due to an unfavorable geological set

up for accumulation of ground water. Most of the open wells which are present in the area remain dry during summer and a few of them yield poor quantity of water.

The sounding curve obtained at Settibettu site represents a typical four layered type. The field curve was interpreted and layer parameters were determined using a computer programme. During the field survey, a termite mound was also noticed 3 m north of a site selected by the electrical resistivity method. The height of this termite mound is about 1 foot from the ground surface, being associated with colonised growth of vegetation. It is also observed that a few more termite mounds are found associated with phreatophytes. It shows an ecological relationship of the termites with phreatophytes (commensalism) and with the vegetation colonizing their mounds (mutualism). It is interesting to note that the well site selected at this point using both the techniques is yielding sufficient quantity of water.

This study reveals that the occurrence of termite mounds in hard rock areas can serve as one of the external indicators of existence of concealed ground water potential zone, as mentioned in the Varahamihira's Brihat Samhita. This is strongly supported by the actual field survey using electrical resistivity method.

Wtr-3 Community Water Purification Practices

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Strychnos potatorum seeds are used in some traditional societies to purify water. In this research, initially the ability of this seed to bacteriologically purify water was studied. In the laboratory there was no bacterial purification.

Subsequently similar studies were carried in the setting of the community where this is still practiced. While clarification of turbidity was identified, there was no bacterial purification observed. Increasing time or addition of salt did not make any difference.

The actual traditional practices were also studied in detail. This traditional practice is restricted to one district in the state of Tamil Nadu. In this area most people are aware and practice this method as a natural process. The seeds are readily available in the market and grocery shops.

One of the interesting observation is the effort people make to keep clean the water tank (Oorani) meant for drinking purposes. With increasing drought there is a change in the efforts for cleanliness as clean bore water is provided.

An attempt was made to determine the relationship of this practice with the incidence of diarrhoea. Only one person out of 139 persons interviewed complained of diarrhoea either on the day of interview or during the week preceding the interview.

The literature indicates that similar practices are following in different parts of the developing world. In Indonesia there is another seed that of *Moringa oleifera* which is considered to purify bacteriologically as well.

Wtr-4

Traditional Water Purification Methodologies

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The Rigveda has narrated the importance of water. Older texts and Ayurveda have described a number of water purification methodologies, which were traditionally in use in our country. An effort has been made to explain traditional water purification methodologies citing original Sanskrit texts and public health experts views on these older systems.

Water treatment consists of many processes-screening, coagulation, flocculation, sedimentation, filtration and sterilization. Most of these water purification methods have been followed by our elders through traditional practices. These of copper, silver, gold, brass and bronze vessels has been customary and now we know that noble metals have effective germicidal properties. Health and hygiene traditions followed in religious places, kitchen, community cook houses, feasts and quantity of water.

Water chemistry related to public health could be explained as follows. Disease causing bacteria are not found in nature, these are excreted by infected persons and hot blooded animals. Hygiene practices avoided contamination of drinking water sources. Sand and other compound filtration, and storage methods removed a large concentration of bacteria, subsequent numbers were reduced by UV present in sun-light and oxidation of air. Oxides of Ca, Mg, Fe and Al present in ashes, lime,

alum etc on hydrolysis formed precipitates and floc, which were very effective in removal of suspended impurities and bacteria by absorption and complexation. Potassium permanganate (red powder used in wells in rural areas) was also popular and used for oxidising organic residues and bacteria. Natural zeolites, the complex silicates present in soil and sodium permutit were used for water softening as natural ion exchange resins.

Marriages are responsible in controlling water-borne diseases. Wells, ponds, rivers and community water reservoirs are regarded as sacred places and strict laws have been made to keep these free from contamination. It is described that a traditional method of water purification involved following sequence. If water is contaminated first filter it to remove worms then expose it to sun light or boil or quench it with red hot stone or brick or iron. Again filter it and remove impurities by treatment with drumstick, nirimali, mukta, gomed etc. Finally make it aesthetically acceptable by imparting aroma by addition of camphor, sandal wood, champak, punnag, nagkesar, patlapushpa etc. In Brihat-samhita desalination of ground water by a mixture of herbs like Bhadra Musta, Usita, Rajahosataka, Amalaka, Kataka etc. has been described.

Wtr-5

Factors Affecting Irrigation Institutions: Case Study from Kaveripakkam and Dusi-Mamandur Tanks

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Proper irrigation management requires well set functioning of irrigation institutions not only to oversee the system but also to perform different tasks in each phase of irrigation management. If an individual owned and harnessed an irrigation source (say wells owned by farmers) his irrigation problem is much limited compared to many farmers using a common source of water such as tanks/government canals. In the latter case effective irrigation management can be done only by way

of building an effective irrigation organisation by involving the users of the system. However, the users are not generally homogeneous in several aspects such as caste, class, land ownership pattern, location of land from the supply source, accessibility of water other than the common source and so on. These aspects may generally be classified into institutional, physical, technical and socio-economic. Each aspect makes difference of opinion among the large number of users in an

irrigation system. In order to solve most of the problems and make better use of available water, irrigation organisation should be strengthened and it should be given proper recognition by the government. If irrigation institutions are effectively

functioning most of the physical as well as technical problems can be solved fruitfully. If it is less active more problems will occur which may be difficult to resolve it. This could adversely affect the system in the long-run.

Wtr-6

Bioindicators in Indian Hydrology

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The ancient scientific Sanskrit text of Jyotissastra, (astronomy-cum-astrology), called Brihat Samhita, i.e., Master Collection, authored by Varahamihira (AD 505-587) deals with different types of bioindicators to tackle various complex ecological and environmental problems of practical importance. The bioindicators of hydrology discussed in this ancient text, and their significance in current context are as follows

Bioindicators of Ground Water

In Chapter 54, Dakargalam, i.e., *key to water*, bioindicators are employed for exploration and exploitation of ground water resources with ecological equilibrium in hard rock terrains of arid and semiarid climate. These indicators primarily consist of phreatophytes (or 'well plants'), morpho-physiologic features of plants, and termite mounds commonly associated with vegetation.

The bioindicators consisting of different animal species, exhibit conspicuous behaviour in response to geophysical gradients developed by ground water of varying quality, quantity, depth, and direction of flow. Such types of animal behaviour are described as modal action patterns (MAPS) in ethology. The indicator animals, during dry seasons lie in the subsoil in a dormant state, called *aestivation*, suspending their normal physiological activities which correspond to a state of *Yoga*. Further the animal responses to ground water provide the clues to determine the scientific basis of *water divining* (also known as *dowsing* or *water-witching*) which is generally considered as magical and mystical.

The bioindicators of ground water were successfully employed for location of well-sites in the drought-hit Saurashtra in 1986 under the *Technology Mission on Drinking, Drilling, Hubli*;

he presented the results of the borewells in the Session on Indian Ground Water Hydrology in the Congress on Traditional Sciences and Technologies of India held in December 1993 at I.I.T., Bombay. His data include 395 well sites located by geophysical methods and 532 by water divining during 1987-1993; and it is amazing that the results achieved by water diving are found better when compared to geophysical surveys.

Bioindicators of Rainfall Prediction

A chapter, entitled *Sadhyo-varashana-adhyaya* points out the bioindicators of terrestrial, aquatic, and aerial environments for short-term prediction of rainfall. These indicator species conspicuously respond to the external, enhanced, atmospheric vapour pressure, developed prior to atmospheric precipitation, by adjusting osmotic pressure in the internal body fluids to maintain homeostatic equilibrium.

The bioindicators of Indian hydrology, discussed in Brihat Samhita are extremely significant in drought-prone and quake-prone and quake-prone regions. These bioindicator methods constitute ideal *people's technology* which is easily understandable to the general public and acceptable to the scientific community. Hence these methods are most appropriate for successful implementation of rural development programs for rapid socio-economic progress. Further, these bioindicator studies of Indian hydrology are extremely important during this *International Decade of Natural Disaster Reduction* (IDNDR) in the *International Geosphere-Biosphere Program* (IGBP) as a top-priority item in the *Agenda of Science for Environment and Development into 21 Century* (ASCEND-21).

Wtr-7

Social Organisation for Land/Water Resource Management

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This paper is about social organisation forms and processes in relation to sustainable land and water resource management, for recovery in situations characterised by degraded natural resource base, defunct or misfunctional management systems, inadequacy of assets, production, income and employment and endemic indebtedness for subsistence.

The first part of the paper is a case study of social organisation efforts as they have emerged and functioned in two tribal hamlets in South Rajasthan Aravallis near Udaipur around the protection and regeneration of upstream community pasture, a lift irrigation scheme, mutual aid for land improvement and woman's savings group.

In the second part there is an assessment of the impact of the social organisation efforts in terms productivity, self-management, political empowerment and sustainability. This is followed by a brief discussion of the concept and strategy related to social organisation and institutional development in the

Indian rural-agricultural context.

At the end, an attempt is made towards a perspective for the dynamics of social organisation at the local community level and provide some lessons and leads for action.

Wtr-8

Water Management in India - an Historical Perspective

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This paper discusses the water management techniques in ancient India beginning from the Harappan culture to the Mughal period. Based on the available archaeological evidence, literary references and inscriptions the paper throws

much light on the use of traditional science and technology in different forms of water management in various regions of India

Wtr-9

Tank Irrigation Technology

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South India has had a long history of human intervention in the management of water for agriculture because of its distinctive climate-intense monsoons followed by protracted droughts. Simple water harvesting structures were often built in sequential chains, starting with smaller systems at the head of a watershed and working downwards, with increasing system size or number towards the valley bottom. As successive tanks were constructed down a chain, careful attention seems to have been bestowed to the respective rights of upstream and downstream users when calculating the height of each tank's bund and surplus weir-the means of regulating how much of the catchment runoff could be retained also made by a simple design of a calingula improvised with wooden shutters to temporarily store some additional quantity of water over the design capacity during the receding stage of flow, so as to utilise it in an effective manner later on. The sluices were also designed with two inlets each functioning at a different level of tank storage, so as to facilitate economic use of water. Construction was carried out by villagers, who also developed their own institutions for maintaining and operating the systems as common property resources. The picture is of a society with considerable technical sophistication, a decentralised approach to water management and a well defined sense of local water rights and responsibilities.

The tanks, however, do have certain design and operational shortcomings. While the chain system facilitates harvesting and conserving most of the runoff from the catchment in the series of tanks, it also created some difficulties during very heavy rainfalls. If any one tank, particularly from among the

top ones breached, it resulted in damaging the successive tanks down below also with a cascade effect.

The sluice pipes placed to convey the water from the tank storage to the tank ayacut (command area) also tended to get choked up, as their diameter was small and the silt could not be cleaned by the water users effectively. The blockage instigated the farmers to draw water to irrigate their fields through man made cuts in the tank bund.

The number of sluice outlets provided in a tank do not also seem to have any bearing on the extent of the command area they can irrigate. The larger tanks have fewer number of sluices as compared to the smaller tanks for a given unit area they are expected to service. For example one tank with a command area of 260 ha. has four sluices, while another tank having 25 ha. has an equal number. The more the number of sluices the faster the tank water will get depleted.

The land use and the characteristics of the catchment areas of many tanks have undergone considerable changes since the tanks were originally constructed. These changes, including road construction, encroachments and infestation by weeds, among others, have reduced the utility of many tanks.

It is time that these problems are addressed not only by the farming community but by the Govt. Departments and the Scientific community and Non-Govt. Organisations as well. This paper describes some efforts made by PRADAN, a Non-govt. organisation involved in tank rehabilitation and regeneration of farmers' management of the minor irrigation tanks in solving the problems and the results of such efforts.

Learning from Local Communities: A Case of Traditional Water Harvesting from Gujarat

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Local Communities have evolved several innovative techniques and institutions to combat the problem of water scarcity in arid and semi arid regions. Though many of these techniques may not be optimally efficient, several of these continue to be relevant for the survival of the communities in the marginal environments. Our contention in this regard is that the scientific community has failed to draw upon the local traditional technologies adequately to develop new alternatives. An attempt to understand the local solutions may lead to interesting insights which could contribute to the development of sustainable technologies. In this paper, we will discuss one such case from Banni area in North Gujarat.

Large part of the Banni area has saline deserts and is situated in the North-Western part of Gujarat. Virda is a traditional technique by which fresh, portable water is extracted by the pastoralists in this area. The structure is unique for the reason that fresh water extraction is possible in areas with saline ground water such as Banni. The rainfall in the area is meager and the annual average rainfall ranges around 317 mm. The only way to harvest the rain water is through natural depressions or artificially excavated tanks. In the post-monsoon season, when the water in the tanks dries up, Virdas are constructed on the bed of the tanks to extract the water trapped

in the top layers of the bed of the tank. An attempt is made to explain the principle of working of Virda drawing upon the local knowledge systems. The first few years after the tank is extracted, Virdas are not constructed in these tanks. This is because, the Virdas are not constructed in this period would yield saline water. Over this period, the salts in the soil in the surrounding area of the tanks through which the infiltration takes place, get leached away. In the later period, Virdas yield fresh water as the top layers of soil are no longer saline. This process implies towards an interesting insight viz. to leach down the salts in underground soils to store fresh water. The trapped water in the top layers may be explained by the phenomenon of formation of recharge mounds below long standing sources of water (Todd, 1980). Further research is being carried out for empirical evidence to support the above hypotheses and also to analyse the institutional arrangements associated with the technique.

We will also discuss different other forms of Virda from other parts of Gujarat with the modifications made by the communities according to the changes in the surrounding environments. The paper concludes with a discussion on the possible solutions as an outcome of the study in contrast to those that have been provided now and some areas for further research.

Common Property Resources and Management: Locally Organised Collective Work in the Management of Sacred-Grove Springs A Case Study from the Western Ghats Region

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Common Property Resources (CPRs) play an important role in the agro-ecosystems in the state of Tamil Nadu, the most important being surface water and ground water resources for irrigation purposes. CPRs have been steadily reduced in extent and importance in the modern times due to privatisation, encroachment and Government appropriation, pushing the resources out of community control and use. This paper focuses on a surface water irrigation system used and maintained by a locally organised community group in Therkumedu village situated at the foot hills of Southern Western Ghats in Tirunelveli district, Tamil Nadu. The village is located 14 kms. from Courtallam, a tourist centre famous for its water falls.

A group of six springs (five of them perennial) contribute exclusively to the community management system for irrigation and drinking in the village. These six springs along with the surrounding area of 2.4 acres belong to the adjoining

village of Karkudi and the whole area is given the status of *Sacred-grove* and protected by the local community. According to the village map, the agricultural land surrounding this resource belongs to the Karkudi village which is owned by farmers from Therkumedu village. Annual land tax is paid by these farmers to the Karkudi Village Office.

Water for drinking purposes is collected only during severe dry periods (March-May) and there is no set of rules for regulating/managing this use of the resource. But the management of irrigation is solely vested with a homogeneous group of farmers from Therkumedu village. The use of water for irrigation is limited to the group of farmers owning land near the resource, thereby making this a closed-access resource. There is no involvement of Government organisation or external support/interferences in the management of this resource, except the use of water for fish culture based on Government lease.

The irrigation system operates in such a way that the field lying farthest to the water source is irrigated first and once the field is filled up the field above it gets irrigated and it continues along the canal upwards. All the farmers, who use this resource, select a person who is given the responsibility for implementing the above irrigation procedures evolved during shortage of water are settled among the user group itself. This closed access nature of the resource has made it possible for the locally organised cohesive group to make the management/use rules and regulations simple and acceptable to all resource users.

The water which gets collected in two ponds from this resource, are used for fish rearing along with various other ponds of the village. This is exclusively controlled by the Government officials of the Village Panchayat union office situated at Shencottah (9 kms away from the village). The ponds are leased in by the villagers for fish rearing/capture. The income derived is deposited with the Village Panchayat Union General Fund and is used for construction/maintenance of infrastructural facilities like roads, tanks, bunds etc. The agricultural fields and fallow lands are used for grazing and duck rearing by the villagers. These resources, especially the agricultural fields in Therkumedu village are allowed to be used free of cost in contrast to the system of leasing out by the nearby villages.

Wtr-12

A Traditional System of Irrigation Facing Extinction

A case study of River spring channels in Palar River Basin, Tamil Nadu State

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A unique, centuries old system of irrigation in Tamil Nadu is irrigation through river spring channels. This is an unusual type of extraction of groundwater from the dry river bed in an environmentally sustainable manner. This system of irrigation which reflects the river ecosystem of Palar river, is facing extinction now.

The river spring channels are based upon the hydraulic principle that a given surface flow requires less gradient than that required for an equivalent subsurface flow. The spring channels are with or without a large diameter mother pit called the *spring heads*. The spring heads and channels are hand dug into the alluvium to a depth sufficient to encounter the sub-surface flow. Because of the difference in gradients required for the flow, the groundwater drains out into a surface flow. This flow gradually gains a net head within a few kilometers downstream, sufficient to irrigate commands several metres above the local bed of the river.

There were about 132 spring channels in Palar basin irrigating an extent of 5635 ha, of which this case study relates to 37 spring channels. To preserve the river ecosystem in general and to preserve the environmentally sustainable irrigation through river spring channels in particular, the Government of Tamil

Nadu implemented the Palar Basin Rules in 1931. But after independence there was a dire need to increase the food production and so the Govt. of India introduced the grow more food drive. The Govt. Tamil Nadu was going on issuing a number of relaxations to the Palar Basin Rules in order to increase the area under well irrigation. This resulted in gradual deterioration of the spring channel irrigation, evidently due to lowering of groundwater table, due to large scale extraction of groundwater from increased number of dug and bore wells in the basin, in an unsustainable manner.

Now the irrigation through spring channels is facing extinction and only a few channels are functioning today.

A general picture of the ecological farming in the basin in the ancient, medieval and British periods are depicted in the paper. The advantages of spring channel irrigation over well irrigation, the unscientific approach in excavation of new wells in the basin under the provisions of the relaxations of the Palar Basin Rules, the present simple way of operation and maintenance of the spring channels by the farmers, the adverse effects due to the spoiling of this system, the remedial measures to save the Palar river ecosystem and spring channel irrigation etc are discussed in this paper.

Wtr-13

Dams-an Engineering Analysis of Alternatives

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During the past four to five years there has been a lot of debate on the Sardar Sarovar Project. The debate has been primarily between the Narmada Bachao Andolan and some other non-governmental organisations on one side and the governments

of Gujarat, Maharashtra, Madhya Pradesh and Rajasthan on the other. Practising engineers and academics have been involved in this debate only peripherally, often as experts or consultants, barring a few exceptions.

It appears from this nationwide debate that the Sardar Sarovar Project has been under attack not only from considerations of social impacts and environmental damage but from a number of technical/technological considerations as well. Some alternatives to the Sardar Sarovar have also been suggested. However there has neither been a detailed analysis of these alternatives nor has there been much discussion or debate about them within the engineering community.

The debate may be carried out at two levels. One would be a discussion of alternatives within the current perspective where the objective would be to choose the lesser of two or more evils. The choice of the word 'evil' rests on the fact that all modern technological solutions are fraught with undesirable and unplanned side effects which are seen either immediately or in the not too distant future. The real alternative then would be one in which such side effects are anticipated and taken care of at the start of design-which we will show to be characteristic of traditional engineering solutions-and not merely managed after the design and construction is complete.

The second debate then, is between tradition and modernity. The terms *tradition* and *modernity* are not meant in the historical sense but are used to indicate the two different perspectives. In the light of the second debate the first may be seen as more of a choice between techniques than as one between alternatives. Here only the latter debate will be considered in detail, in particular between the Sardar Sarovar Project and the Anangpur dam (Anangpur is a village south of Delhi)

In Section 2 the design methodology on which the modern dam is based, is studied and possible flaws in this methodology are highlighted. The Sardar Sarovar Project has been used as an illustrative example.

In Section 3 we describe the Anangpur dam and show the engineering flaws present in the modern design are absent in the traditional design.

Section 4 discusses some of the engineering side effects of the modern dam and contrasts them with the traditional design.

Finally in Section 5 we present the main conclusion of this thesis and indicate the possible directions for future work.

Wtr-14

Traditional Water Harvesting Practices, Irrigation and Drainage Systems of Ancient India - An Insight

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In this paper an attempt is made to unveil various traditional water harvesting practices, irrigation and drainage systems and the deep insights thereof, which can be of immense help in pursuing the present need.

The excavation of the pre-historic sites of Harappa, situated near the bank of the Ravi and Mohanjo-daro near the bank of Indus river, reveal the foundation of these cities in accordance with pre-arranged scheme. The absence of awkward gradients in the flat Alluvial plain upon which both were built, signify the knowledge of drainage with the steady raising of the level of these cities, so as to keep them out of the reach of floods. The methods of drainage adopted by the Harappan people, are especially well demonstrated at Mohanjo-daro and Chanhudaro; they are certainly the most complete ancient systems yet discovered.

In the Vedic conception period, irrigation occupied an important place as lack or failure of rain was detrimental to crops. In fact, irrigation includes all operations or water harvesting practices including the conservation and storage of water supply, carrying of water from the source of supply to homes and fields. It demonstrates engineering skills of immense importance.

In a treatise on agriculture by Sage Kashyapa, a comprehensive foundation is laid down for site selection of reservoirs on the basis of land gradients, soil structure, situation of human

habitats. In the practice of building reservoirs, Kashyap gives a detailed account of the shapes, sizes, embankments, courseways channels and sluices.

As the root of the progression of life is the process of selection. This may be natural as well as cultural. Nature is continually throwing up variations and so are the people. The basic difference is that nature produces variations by chance while people do so by design. This continual production of variations is grounded in the evolution of life. In this context, the traditional variations have a close linkage with the present era. With little innovation & modification, traditional water harvesting practices have a lot to offer presently, rather than being dead systems.

A careful analysis of the ancient literature leads us to several important principles which are as under:

1. All the techniques, inventions and systems developed during these periods, have fully conceded the supremacy of the natural order in accordance with the natural balance of the hydrological cycle.
2. The best course of action was always the principle of *least interference*
3. The sites and scales of reservoirs were determined on the basis of physical as well as local socio-political considerations.

4. The best path was always the *Suvarna-Madhya*, i.e. the middle course between two extremes.
5. The principle of participatory approach with cooperation for the distribution and upkeep of the water resources.
6. Top priority was given to the protection of perennial sources of water and their surrounding vegetation for development of any river basin.
7. *Trapping where it falls*, rather than impounding rainwater in mammoth reservoirs downstream, was the real essence of ancient wisdom as insisted by sage Kashyapa.
8. The construction, control and maintenance were the responsibilities of the local people.
9. Use of gravity and gradient as far as possible so as to minimise the external use of energy.
10. In conceptualization, commissioning and execution, the sages, Kings and people were made responsible at their own level.
11. Water reserves were always considered as sacred entities and not merely a resource to be exploited.

Wtr-15 Surface Water Resources of Kanayakumari District-Boon or Bane

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Man, having perfected the methods of development in many areas failed in managing water resources. With an increase in population, the need for water is also increasing. But the available water resources are very limited even the available resources are mismanaged or polluted.

Down of Twenty first century has to face many problems ahead. Among those, the problems pertaining to water and air must be looked in to very carefully.

Water is one of the most important critical resources, whether it is for agricultural irrigation, power generation or for purpose of drinking etc. Realising this importance the great Saint Thiruvalluvar said even before 2025 years that *World cannot exist without water*.

Water conservation, better utilization, good management was existed in the process of human civilization long before. According to one of the report of Archaeological survey of India even before 2,700 years there was sophisticated water management skill, no doubt even in South India there was also existing such skills.

In the present paper, surface water resource with special reference to Kanyakumari district of Tamil Nadu will be highlighted. In this district more than 2,000 tanks are existing. Water from these tanks were used for community needs, irrigational purposes etc. These traditional tanks and its water usage was controlled by waterman locally called *Neerpaachi*. He was possessing the power to let out the water when requires, and also having the monitor the misuse of water resources. In this district most of those traditional tanks are facing ecological succession. Some those ponds are also filled with soil and used for different purposes like for construction of bus-stands, stadia, housing schemes etc. During the rainy season the run-off water was also stored here. Such stored water resources was responsible for ground water recharging. If such ponds are not there the rain water goes as a waste. It has been observed now that the ground water table is going deep and deep, in this district.

In this district two important traditional technologies exist for water management. These surface water resources management are centuries old. However these technologies are in a dilapidated condition.

They are check dams constructed across the river Pazhayar and AVM canal. The river Pazhayar of Kanyakumari district of Tamil Nadu has been intervened by various anthropogenic activities. The river has its origin in the southern tip of Western ghats. At the base of the hills rivulets are confluenced to form major dams called Pechiparai and Perunchani dams. At present there are about thirteen check dams in the course of 36 km length of the river before it confluences with Arabian sea. The annual rainfall of this region ranges about 1465 mm. These check dams are constructed mainly for irrigation and community needs. Now the riverine banks are encroached in most of the places. The check dams are not desilted. The macrophytes are choking the dams. Silting and choking of the riverine beds are responsible for breaching of banks causing flash flood. In 1992 major flood calamity occurred causing damages to the property and lives, here.

An indepth understanding, renovation of check dams, removal of illegal occupation are the need of the hour to solve the water problems.

The AVM canal (Anantha Victoria Marthandavarma canal) was formed in July 1860 during the reign of Raja Marthandavarma of Travancore state. AVM canal was a scheme for connecting Trivandrum with Kanyakumari and thus extending the water communication. It also meet the freshwater requirement of coastal villages. But to-day the purpose is no longer served actually. The canal is completely polluted by coconut husk retting operation. Thus it acts as vector producing centre. In some coastal villages like Enayam and Mulluthurai the canal is completely encroached. In some places the influential people managed with revenue officials to get the 2 (C) patta and silted regions of the canals are converted into palmgroves.

The slow death of this traditional technology in which the excess free flowing water during the flood period was not channeled in this canal that denies the coastal community's water requirement and navigation. These coastal village people have to travel 4 or 5 km to take bath and wash clothes. During their sojourn they bring potful of water for drinking when they travel in buses, to their houses.

Now the question before us in the name of development and thoughtlessness are how we are prepared to loose this traditional skills which are evolved after centuries of trial and error? If so we will have to pay for it by way of loosing this (water) very important natural resource.

Wtr-16

Ingenious Traditional Tankfed Agriculture: Two case studies from Ramanathapuram region

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Thousands of irrigation tanks in Tamil Nadu are the scientific hall mark of ingenious innovation, on ecological conservation and stabilising rainfed farming, of ancient Tamil civilization. Tanks are the appropriate water harvesting structures to regulate flood and to mitigate drought. Tanks insure rainfed paddy by providing protective irrigation during drought spells.

Black cotton areas farming productivity gets high dependability because of tank system. Cascade of small tanks provides an unique cropping environment in the region. Two case studies are discussed in this paper to draw inferences on tankfed agriculture in Ramanathapuram region. Relevance and appropriateness of tank system in farming, technology of *semi-dry* or so called *upland* paddy, crop diversification in tank

irrigation, duty of water in tankfed agriculture and the challenges of present time are dealt with elaborately. Variation in rainfall and its bearing on tankfed agriculture is also presented. Community managed water management system is practiced over many centuries by the farmers of that region for efficient production.

Tankfed agriculture offers solution to big-dam displacement issue and localised management in conserving water and farming effectively. Present day agricultural scientists have to unearth the sound principles behind the tank-fed agriculture to reinforce the practice and recognise traditional wisdom and 'Pride' of our farmers.

Wtr-17

Irrigation - A Socio Technical Enterprise

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Identifying crucial elements of community managed additional systems for rejuvenation or extension

This paper is set in the context of the present need to increase agricultural productivity through increase in irrigation, more so in the minor irrigation sector.

It starts with the premise that irrigation has to be conceived as a socio technical enterprise if it is to be sustainable. That the human or social dimension is important is not a new approach as far as Tamil Nadu is concerned. Looking back into the history of surface water minor irrigation schemes (tanks) in Tamil Nadu we find a glorious record of community managed systems that survived over time.

Based on field investigations and case studies the study seeks to identify crucial aspects of these systems which fulfilled the functional requirements of social systems. These are Pattern Maintenance, Goal attainment, Adaptation and Integration. Successful systems met these needs and if as in the case of Kannangudi the tank in Pudukottai district the integrative need

(parts of the system are positively related) is not met then the old system has to be altered and a new approach to integration has to be adopted. Today, when heavy investments are being made to rehabilitate minor irrigation systems such an analysis becomes relevant.

The three qualities traditional cultures have and which these irrigation systems considered as socio cultural systems had in common were, Leadership or Hierarchy, Holism and continuity. Hierarchy or leadership was a strong feature of these ancient systems where there were definitely people who were accepted as leaders. Roles of watermen etc were well defined. Holism implies that it is not the individual but the collectivity that is important. For all practical purposes each tank was a separate unit, and actors were only those who had an interest in the water. Continuity should be interpreted as sustainability in the traditional systems functionaries like Nattammaikaras or Neerkatis were hereditary.

The next section focuses on the breakdown of these systems by a weakening of the crucial qualities of leadership, holism

and continuity in the recent past. In conclusion the study engages in a futuristic model for interventions both in situations (a) where traditional institutions have weakened (b) where there is no tradition of collective effort in managing common resources.

Tradition cannot be completely identified with the past, what is modern today is tomorrow's tradition and our objective is to engage in processes of intervention by which sustainable systems become the tradition.

Wtr-18

A Model for Simulating Rainwater Harvesting Systems with Covered Tanks

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Most rural communities in the Arid and Semi-Arid (ASA) regions of the developing world are dependent for their water needs on sources that are meager in quantity and unreliable in nature. This is because these sources in turn rely for their continuing functioning on a very little and erratic rainfall. The challenge is to integrate these fluctuating sources into a network that can meet the needs of the community in a reliable and sustainable manner. Designing of such a network would be greatly facilitated if we could accurately model the potentiality of the individual element of the network.

Over the years scientists, often in a different context, have developed various conceptual frameworks and computational techniques for modeling the water resources available to the rural communities in the ASA areas of India.

The collection and storage of rainwater, the so-called rainwater harvesting, is an important source of water for the rural communities of ASA regions of India. As a part of the project a model for simulating the performance of rainwater harvesting systems in which the water is stored in covered tank has been developed. The model explicitly takes into account the fluctuations in the annual rainfall, this is done by using the past rainfall record, for the given place, to define a probability distribution and then use this probability distribution for the Monte Carlo simulation of the rainwater harvesting systems. The model can be used to find out the minimum catchment area and the tank size required to meet a given water demand

reliably. Often such optimum systems are not economically practical, than the model can be used to find out the fraction of the demand that can be met by a system which the individual or the community can afford to build.

The importance of such simulation is that they can provide an essential information for evaluating the role of rainwater harvesting in community's strategy for meeting its water needs. In the paper this is illustrated by simulating the performances of the rainwater harvesting systems located in Chaksu (Rajasthan). In case of Chaksu, even with the simplified assumptions made for the water demand, few conclusions are clear. The rainwater harvesting system by itself cannot, except in the rare cases of very large systems, meet the entire water demand of a household or a community, but it can meet a significant fraction of it and therefore should be considered as a viable source of drinking water.

These conclusions naturally suggest that the next step should be to extend the present model to include other local sources of water like Talabs and wells. For it is unlikely that any one single source by itself can meet the water needs of a small rural community in arid or semiarid zone, therefore one will have to look for a combination of various sources, each in itself unreliable and inadequate but combined in a manner so that together they can provide an adequate amount of water for the community. It is in designing such networks that computer simulation will play an essential role.

Fisheries

Co-operative Planning: A Step towards Development of Reservoir Fishermen

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Reservoir Fishing is mainly a culture based capture fishery.

Fishing in the lake became a remunerative activity for the people living around the locality when the reservoirs were formed from the early 1950's onwards. Much later in the 1980's the formation of fishermen cooperatives have served to consolidate the interests of the Schedule Castes/Schedule Tribe fishermen. Financial support through Government grants have induced changes on artisanal fishing and fishing converted from country made coracles to motorised boats. Even after a decade of existence, the co-operative remained to function without being able to attain any improvement in the life of people who are its beneficiaries. The number of co-operative members who depend on fishing for their livelihood remain considerably low. A deliberate effort for integrating, planning

as an institutional mechanism of the co-operative has been attempted with the formulating and implementation of the CAP (Co-operative Action Plan). A CAP as such is a participatory planning exercise formulated in a large gathering of the co-operative members and their families, and it cover wide ranging needs of the community and outline efforts to be taken in realising the needs. It was on the initiative of Indo-German Reservoir Fisheries Development Project that such an effort was made in five reservoir co-operatives coming under the project. These plans were able to serve the "missing link" between local community level planning and that of the District authorities. This paper narrates the experience of co-operative planning in five of the Reservoir Co-operatives with which project started working.

Strategies and Plans for Reservoir Fisheries Management

Suresh kumar

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There are about 30 reservoirs in Kerala used for irrigation, electric power generation and water supply for domestic use. The total water spread area of these reservoirs is about 30,000 ha. Ten reservoirs presently are managed under a culture based fisheries, stocked by the Department of Fisheries and harvested by members of fisheries co-operatives and independent fishermen. The overall goal of the Indo German Fisheries Project is to improve the utilisation of the reservoirs for fish production

with highest possible participation of and benefits to weaker sections of the population of the reservoirs. To this end activities concentrate on stocking and production of fingerlings, monitoring of the harvest and on facilitation of the participatory management process. Since the Indo German Fisheries Project is the only one in India with an integrated approach it could act as a catalyst in the management of reservoir fisheries in India as a whole.

Women's Participation in Fisheries

Nallini Nayak

PCO Trivandrum

Women have from all time been actively involved in fisheries.

Whereas in some parts of the world they have been good navigators, they are involved even in massive capture fishery as still exists in a limited area in our neighbour country of Srilanka. In India they have been involved in the preparatory phase, by the net weavers spending long hours making, setting and mending nets. It is also interesting to note that in the matrilineal societies of south India, the daughters have inherited the fishing gear from their parents at the time of marriage and it is they who are owners of the catch. For example, in Kasaragod district of Kerala state the fish catch is physically divided when landed on the shore. Each woman owner - of the boat then takes custody of it and handles it from them. Today, in the modern fishery, some women in Visakhapatnam even

advance the running capital for a fishing voyage to the trawler boat owners. This given them a sure hold over the catch landed. In Tuticorin, women are known for their skill as pearl divers and in many areas they dive for cockles sea weed and mussels. In the inland water in Kerala, they are known for their expert - skills of catching shrimp with their fingers - *thappuka* as they are called. They can be seen wading in the water of the Vembanad lake. While the above may only be stray examples, the larger and more accepted phenomenon is the participation in post harvest activity. Fish, unlike most other agricultural products, cannot be stored. Neither can it be the major good component in the diet. If therefore has to be exchanged for other food and with efficiency and skill before it deteriorates.

This task of preservation, distribution and converting the catch into food, has always been the prerogative of women.

Today women in fisheries, like women in all artisanal sectors, are being marginalised or being turned into wage labour. First of all, in the matrilineal societies, where they owned the craft and gear, the system changed radically when the state intervened and made loans available to fishermen alone. The men became owners of craft and gear.

In a community where dowry did not exist, it gradually began to be introduced, women gradually had to enter the competitive process to get fish if they still wanted to remain in fish vending.

The introduction of ice and refrigeration is considered to have radically transformed the distribution of fish and this is true. But it also facilitated the entry of other interests in marketing. People who had larger capital, better transport facilities, and these were mainly men, became participants amidst whom poor women were poor competitors.

The construction of landing centres and harbours has also generally affected women's role in distribution. With large catches that are landed and with larger men merchants in the fray, women have not been able to take advantage of these situations.

For women who do not have either the resources or the entrepreneurial skill, they have been turned into wage labour either unloading the fish from the boats, or drying fish for merchants

who purchase in bulk. There are women employed in the sorting of shells at certain landing centres too.

A large number of women lost their only source of livelihood when machine made nylon nets were introduced for fishing. Today, the modern sector claim that jobs are created in the shrimp and canning plants. It is true that there is work for women in this sector but all under very exploitative conditions. In the broader social movement: when we speak about change, it means that we do not fully endorse the on going processes of development.

It is a confirmed fact that modern development, that is technology intensive making use of non renewable energy resources, cannot be sustained on the one hand, and on the other hand has been used to the advantage only of a small percentage of the population. In this process, the poor at large get more and more disadvantaged and the plight of the women becomes harder. In our area women from the fishing community are forced to even go in for undesirable occupations like illicit liquor brewing and prostitution. Hence fishworkers have to organise to fight for their rights of survival and wherever they do, women are in the front of the struggle. In fact, in 1989 when the National Fishworkers Forum organised coastal ecological march from Maharashtra in the West and Bengal in the east, culminating in kanyakumari, hundred of women joined the march spontaneously. This was because the slogan of the march was 'Protect waters protect life'. These were issues very close to their hearts and this gave them the courage to fight against the odds too.

Fsh-4 Technologies, Innovations by Artisanal, Fishermen

John Kurien
Trivandrum

The technological innovativeness among artisanal fishermen is most evident in the design of their fishing gear — nets, hooks, traps etc — and very much less in the design of their fishing crafts. The hallmark of both however is their diversity of design. Traditional fishing craft designs were marked by diversity to start with — a new fishing boat design is apparent across rather short distances of coastline — but they have remained virtually static over centuries. We know from the work of people like James Hornell writing at the early part of this century that many of these designs have been adopted over the centuries by different fishing communities in India, from a very wide variety of regions of the world with which they had economic and cultural contacts. The nature and pace of innovations in gear designs on the other hand have undergone phenomenal changes. These innovations have taken place both by the process of absorption of ideas from exogenous sources as well as significant and dynamic endogenous transformations from within. Though not mutually exclusive, the exogenous innovations have been mainly with respect to changes in material — for example the shift from cotton to nylon yarn for nets and iron to stainless steel for hooks — and the endogenous

changes relate more to incremental changes made in design and techniques of fabrication.

The basis of all the innovative activity is intimate knowledge of the aquatic eco-system on which depends their livelihood. It is a very specific, integrated and deep understanding of the nuances of the physical aspects of the aquatic milieu and the behaviour patterns of the living organisms within it. This knowledge has been passed on from parent to child, from master to apprentice. It is a long cultural continuum of habituated practice stored in the memory and passed on by those who labour primarily through an oral tradition. It is practical knowledge which got conditioned into dynamic cultural practices.

The pattern of the innovative activity exhibits a certain progression of incremental changes by the process of trial-error. There is little clustering and no major breakthroughs. Consequently the innovations remain *hidden* and the real positive/negative impact they make on the labour-process or its productivity are rarely assessed by the innovators.

The motivation for the innovative activity is the ethic of survival. No attempts at modification/change of the existing materials/designs is *sponsored* or driven by the urge for mass production or profit. As a result, the number of distinct, though minor, innovations are numerous. Every active fisherman is a potential innovator. These innovations remain outside the domain of what are considered to be a *new technology*.

The nature of the innovations are such that they are generally skill-intensive and presuppose a certain degree of initial experience and fund of knowledge. Also within a single innovation-type we notice the emphasis on diversity with the accent on specialised rather than general usage. The materials used are mostly locally available. The innovations are largely environmentally benign. Consequently almost all the innovations stay within the community of genuine users. Adoption does not create dependence. On the contrary it reinforces autonomy and self-reliance. Use of the innovations do not engender environmental destruction.

The scale of the innovations are biased towards being small. They are therefore decentralised in their pattern of operation and financially appropriable by the users. Their use does not create or perpetuate socially unacceptable inequalities.

The spread of the innovations is largely achieved through word-of-mouth communication of its merits and a learning-by-using approach. Rarely are the innovations complex or difficult to master by others in the occupation. Due to this, awareness about the innovation to the *world outside* is very minimal.

The sustainability of this kind of innovative activity and these kinds of innovations is in question today. While this process has lasted for centuries and has been at the base of the resilience of artisanal fishing in the country, there is a big question mark over its continuance in this fashion.

This is a matter of concern for all those who are concerned with both the specific features and the general values which such innovations represent.

Fsh-5

OBM'S and the Balance of Power at Sea

Maarten Bavinck

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Motorization of kattumarams has accelerated since the late 1980's in the villages of the Coromandel Coast of Tamil Nadu, whereby it is no exception to find 25% of the craft in a village fitted with outboard engines (OBM). The primary reason for the adoption of OBM's is of course their economic profitability. I argue, however, that OBM's also contribute to restoring the balance of power at sea, which has been severely

disrupted by the introduction of small trawlers and the ineffectiveness of legislation and government action in curbing their deleterious effects. OBM's increase the speed and versatility of craft and allow kattumaram crews to better control the small trawlers plying their waters and extract compensation for the damages they cause. OBM's thereby become instruments of *fishermen's management*.

Fsh-6

Artificial Fish Habits and Impact on Local Fisheries

Titto D' Cruz.S

PCO Trivandrum

Use of Artificial Fish Habits (AFHs) for enhancing fishery resources, gaining popularity throughout the world. The depletion fish stock and wide spread habitat destruction due to the coastal trawling provoked the artisanal fishermen of Trivandrum and Kanyakumari districts of South India to construct a number of small scale AFHs. In Trivandrum district, fishermen Valiathura are the leaders in building AFHs. They have been constructing Artificial Reefs (ARs) by using a variety of materials. Deployment of Fish Aggregating Devices (FADs) intended for the aggregation of Cuttle fish is a recent development in the village, have been innovated by the artisanal fishermen themselves.

A study was conducted to investigate the incremental changes in the development of AFHs. The management practices established by the communities and external interventions of organisations onto this technology were examined. Since the

deployment of AFHs required financial assistance and technical know how to improve the technology the collaboration of organisations working with them found to be effective.

The ARs and FADs deployed in the village has been compared with Natural reefs and open waters. The FADs locally known as *Kanava paar* (kanava = cuttle fish, paar = Reef) contributed significantly to the earnings of fishermen. The ARs and FADs together contribute 15.21% to the total share of hook and line catch of the village. The CPUE revealed that on an average hook and line of the village obtained catch of 2.52 kg of fish worth Rs. 87 daily from the four fishing grounds. The impact of the development of local fishery due to these man made habitats and its consequences on different fishing group working with different types of fishing gears were also briefly discussed.

Fish Attracting Lanterns (FAL) Off Trivandrum Coast: A Case of Innovations by Artisanal Fishermen

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The use of fish attracting lanterns (FAL) is prominent along the coast off Trivandrum during the months November to March. The fishing with lantern - commonly called *light fishing* - is a method which is practiced by fishermen mainly during new moon nights. They use artificial lights to attract fish shoals.

In the past, fishermen going to fish in the sea during night used to take kerosene lanterns with them. It was to give an indication to ships the presence of fishing craft. But since 1985 the lantern is used for attracting fish towards craft. In the beginning kerosene lantern were used to attract fish. Gradually it was replaced by petromax and gas light.

‘Thappu’, A Traditional Skill Of Fisher Women around Vembanadu Lake

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Thappu, is a traditional method by which fisher women dip themselves in water and pick fish from backwaters, filtration fields, chals *thodu* (small canals) etc. Sometimes they use sticks or *vattavala* to catch fish by this method. The *thappu* (fish picking) time varies according to *thakkams*, Shrimps, *Pallathi*, etc. are the usual varieties caught by this method. After catching, the fish is auctioned to wholesalers, but sometimes women themselves sell it in the local market.

Because of conversion of filtration fields to culture fields, these women are denied of work place. Pollution of water and usage of modern nets reduces their catch. They also face certain health hazards like backpain, legache etc. because they have to remain immersed in water for hours. An attempt has been made in this paper to highlight the features and allied problems of fish picking.

Sardine Oil Extraction - A Traditional Cottage Industry

Gracy.M.M

Programme for Community Organisation, Kannamaly (PO), Kochi - 8

The Sardine oil extraction is a traditional cottage industry. The melted oil come over the water is removed. The oil is sold out for different uses. The remnants are converted as chicken

feed and fertiliser. At this activity has almost disappeared due to variety of reasons. This paper goes into the details of sardine oil extraction in Chellanam Village of Kochi.

Filtration - A Traditional and Sustainable Aquaculture

Gracy.M.M

Programme for Community Organisation, Kannamaly (PO), Kochi - 8

Filtration is a sustainable aquaculture traditionally practiced by the people in Kerala. Commercially important prawn variety enter into backwater system at their early life stages. These predating prawns with tridal water are allowed into already prepared field. The periodical harvesting of prawns with the help of sluice net is known as filtration. This practice

was predominant and peculiar in Chellanam village of Kochi. The land scape of this area is very much suitable for filtration. But now a days most of these filtration field are converted into artificial aquaculture, which creates environmental and labour problems. The present paper looks into the merits of filtration and also the impacts of shift from this traditional practice.

Role of Women in Fisheries - A Case Study in Tamil Nadu

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Prawn peeling, fish curing, drying and marketing, net making, fishing in the canals and clam shell collection are the major areas of role of women in fisheries. This study is based on the socio-economic conditions of the fishing communities which have highlighted the role played by women in fisheries. The socio-economic structure of small scale fisheries in India is very complex and there are several factors which influence the role of women in fishery related activities. The participation is governed by caste, though caste structure does not bear any section from engaging in the above activities. Availability of infrastructure is found to be the major factor influencing women's participation in fishery-related activities.

Women in general are hopeful of improving their lives through the development of fisheries activities in their area and show readiness to acquire new skills and undergo training for the same.

What is the general status of women in fisheries? They are benighted not merely by deep-rooted social and cultural attitudes, illiteracy and lack of opportunities for study and jobs, but also by the vagaries of the fishing profession. Fisher women contributes a good deal to their community, but their social status is low. However, greater awareness has now been generated among fisherwomen to tackle and solve their own problems.

Development of aquaculture is beset with several problems, the most important of these being finance. Since there is no savings with the fisherwomen, there is a greater need for institutional finance. Though such facilities have been developed recently through banks, these are difficult to be procured on account of the procedure involved and also because such loans stipulate a part of the expenses to be borne by the fisherwomen who, in fact, cannot afford any expenditure. In

addition, there are administrative and legal problems with regard to multi-ownership of ponds. In some cases, they have nothing to offer as a security to get a loan.

The technical problems are equally as many. Lack of technical information with the fisherwomen if not only on account of her being poor and illiterate but also because the extension agency itself is technically unsound and illequipped. The exhaustive studies made by the Indian Institute of Management suggested improvements of the infrastructural facilities at transit and terminal markets besides development retail markets is necessary.

Marine fisherwomen are also found to be engaged in trading of fresh and dry fish as vendors. In icing and other activities in the processing units, participation of women is found to be very rare. The net making by women is reported to be decreasing with the establishment of nylon net factories.

The age group of women who participate in fisheries are between 13 and 50 years but the education level is found to be at primary and below. The income thus earned is mainly used for buying personal requirements and also added to the household income.

Fish marketing in India is gradually transforming from primitive to modern stage. The basic amenities are not present in many of the markets to carryout the marketing activities properly. The Government can provide these facilities for a cluster of closely located fishing villages, through co-operative societies.

Considering the importance on the role of fisherwomen in fisheries, more emphasis needs to be given for the betterment of the fisherwomen in India.

Health Care

ST-100

03976



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Mercury is said as the semen of Siva in the ancient Indian Tantric scripture. Abhra (talc) is called in it as the ovum of Sakti. The union of mercury with talc led to the philosophy, Rasesvara - darsana. Later it developed to the science called Ayurveda. In the ancient days this science was in vogue among the saiva Tantric yogies.

Similarly, among the Saiva Tantric yogis, the use of magneto-therapy was also prevalent. Though rare, it is still now used by some of the Ayurvedic practitioners, particularly in the district of Balasore in Orissa. Magnet is said as the master (Guru) in the Svachanda-Tantra (4.468 and 5.46). In the Atharva-Veda (1.1.17.3-4 and III 7.35, 2-3) we find the therapeutic use of magnet. The revival of magneto-therapy for the last 20-30 years has undoubtedly brought us to the promising results that the touch of a piece of magnet instantly gives us relief from many chronic diseases like spondylitis, prolapse of inter-vertebral disc, asthma etc, magnet is very effective as Rama's arrow. Surgery can easily be avoided for many a number of ailments by the use of magneto therapy.

Magneto therapy is commonly ascribed as the sister of Acu-pressure, a branch of yogic science. Yoga is spreading so widely that it compels one to believe on the prediction that the 21st century will be the world-culture of Yoga. Combined with magneto-therapy, one feels that God has created not only suffering, but He has also shown the ways of its recovery for a peaceful existence.

The wedding of magnet with yoga and acu-pressure elevates human being. It not only provides us sound health, but also expands the awareness of the user. It makes people convinced

that the imbalance of energy in the cells of the body is the cause of any ailment. When energy is supplied from the touch of a piece of magnet, the charged ions, particles and chemicals in the cells rejuvenate the cells of the affiliated organ. As a result the pain is very often instantaneously relieved. The patient at once feels relaxed. All sorts of ailments, starting from head-ache to stitch, from cancer to cardiac disorder, are treated by these systems. Being free from his ailment, the patient overwhelms with bliss when he listens to the ancient doctrine of *Sakti-Yoga-Darsana* - the combination of magnetic power with yogic acu-pressure for the therapeutic result.

The world is a play of Sakti or power. The body is a gross form of consciousness. Therefore, by the touch of the power of a magnet, a person can enter into the deeper realm of consciousness. Restlessness, anxiety, perplexities, tension, stress and strain are the dualities, known as Maya. Restfulness is the balanced condition called Niscala Tattva or Brahman. It is a state of quietness, harmony, peace or bliss. Such state of unagitation is acquired by the touch of magnetic power - the Spanda or Vibration. It is felt that quiet - consciousness is filled everywhere - *Is a vasyamidam sarvam* - the first famous Upanisadic line of the Traditional India.

This traditional science and technology has been practised not only to heal-all for the physical, mental and spiritual progress, but also to taste the sweet truth that *Health and Bliss are our birth rights*.

As fast as it is to spread among the masses, so swiftly it would cause harmony, production, peace and bliss to all.

Hlt-2 **Plants of Folk Medicinal Importance Practised by Tribals of Chitrakoot (Madhya Pradesh)**

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Plants are the oldest associates of man from very ancient times. Plants in one or another form used for worship or other religious performances, are seen in all races of mankind and there uses are as old as the civilization of Mohan-jodaro. In Buddhist literature many references of tree worship, herbal medicines and tree cult are available. At many places they are presented in the form of folklores and folk medicinal practices.

In the present paper the traditional medicinal practices of tribals of Chitrakoot region is studied and recorded.

The Chitrakoot is situated in the valley of oldest mountain range the Vindhyans. Nature has gifted this valley a parent river the Mandakini, studied area has Vindyan systems of rock

type, particularly Semri and Kaimur series. In this region yellow sandy & sandy-type of soil generally occurs in some region loamy weathered soil is also found. The valley still has lush green tropical deciduous forest. The forest is dominated by *Nyctanthus*, *Diospyros*, *Madhuca*, *Buchnanania*, and *Emblica*.

This forest area is a natural habitat of Kols, Mawaia, Bhills and Baiga tribes. Traditionally these tribals are using various plant species for their day to day health problems. About 1127 plants of folk medicinal importance were also traced out. 25 species of such flora is described in the present paper among them are *Gloriosa superba*, *Aconitum* sps. *Puereria tuberosa* *Cyperus superba*, *Smilax china*, *Convolvulus pluricaulis*, *Onosma bracteatum* etc.

This study of tribal area of Chitrakoot will help to know the biological resources found in this communes could be conserved and utilized for socio-economic improvement of the tribals on the one hand and the country in general on the other. Such studies will bring on record several unknown or

little known uses of plants, animals, folklores etc. Which will help in the discovery and conservation of numerous rare and valuable germplasm of many important plants. Such studies could also highlight the possible factors responsible for the threatened extinction of many species of rare plants.

Hlt-3

Treatment of Sinusitis with ITA -1 (A coded single herbal drug of Unani system of medicine)

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Sinusitis continues to be a major health problem inspite of significant advances in the management of infections and allergies. Its treatment as available in conventional modern system of medicine consisting of use of antibiotics, antihistaminics and decongestants does not cure all the patients necessitating antral puncture and drainage which, too, do not provide permanent relief to the patients. Search of new drugs for effective management of the disease is, therefore, considered of paramount importance.

Symptomatology of Nazla-e-Barid in classical literature of Unani Medicine fully corresponds with that of sinusitis as described in modern medicine. Several drug regimes are in use in Unani system of medicine for the treatment of Nazla-e-Barid Muzmin.

Central Council for Research in Unani Medicine has undertaken clinical trials in sinusitis with various single and compound herbal drugs in its Central Research Institute of Unani Medicine, Hyderabad. One such drug coded as ITA - 1 is given to the patients in micropulverized powder form in the dose of 100 mg twice a day along with milk for 60 days.

The present paper deals with effect of this drug on 200 radiologically confirmed patients of sinusitis. The results suggest that the drug is effective in all age groups and chronicities. Radiological clearance is maximum in frontal sinusitis, followed by maxillary and ethmoidal involvements.

The very fact that ITA-1 is effective and consists of a single herb which is cheap and commonly available in the market supports its use as drug of first choice.

The clinico statistical profile will be presented in detail.

Hlt-4

Some Selective Marmas with Angiological Value

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Marma shareer, a science of vital Anatomical sites with higher life value, has been established to help the practice of surgery by Acharya Sushruta. Acharya Sushruta has signified this science by equating it, as half of the knowledge of surgery. He has elaborated that there are 107 such Anatomical sites in the body, which need special attention of the clinicians during practice. Out of these 107 such Anatomical sites (Marmas), there are several groups as classified in various ways. Among many categories of Marmas as described by Sushruta and Vagbhatta specially, some Marmas are very important which particularly belong to *Sira* and *Dhamani* (Vessels), the same may also be regarded as Marmas with angiological value.

Marmas with angiological value are nearly (37+9=46) in number. Out of all Marmas belonging to this category, there are some Marmas which influence the life of the common people frequently. Any type of injury (Physical or Mental) may lead to severe problems to the people. Thus the common people should be communicated about the traumatology of some selective Marmas e.g. Guda, Nabhi, Matrika etc, for the sake of their good living and health care. The full paper will reveal the fundamentals of some selective Marmas with angiological value, along with the preventive significance of the same by taking the life and living of the common people into consideration.

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Pharmacy branch of Ayurveda developed simultaneously with the other branches of Ayurveda. The sources of Ayurvedic remedies are herbal, mineral and animal. How to make these sources of material suitable for the system are the main objectives of Ayurvedic pharmaceutic. It passes through the various pharmaceutical processes and techniques. These processes involves heating, boiling, drying, grinding, trituration, sublimation, distillation and fermentation etc. upto particular extent. During the process certain characteristics features are developed and these particular features are indicative of the compilation of procedure.

Ancient scholars of this field have established few controlling parameters, through which we may determine that the processing of the various pharmaceutical proceedings the number of the final products like bhasmas, sinduras, parpati, pottali, medicated ghee and oils, confection (avaleha), decoction (quath) and fermentative preparation (asavarishtu) etc. are produced. Bhasmas are prepared through heating process, finally the physical and chemical property of starting material

become changed. How much change is desired, it can be determined through its color, smell, taste, luster, sprinkling and water (varitar) and also through the reduction reaction test (Nirutha and Apunarbhava).

In case of medicated oil some characteristic features are developed through which we can differentiate its mridu, madhaya and khara stages. Similarly in Avaleha paka Darvipralepa, Apsunimajjanam and piditemudra indicates its final stages.

Sachandra (lustreful) Abhrak bhasma, khara paka parpati, dagdha paka oil and shukta asavarishta are not desirable properties and these are indicative of exploded conditions of products. Necessity and utility of process control in this regard is much more to prevent the quality of products on process level.

In this paper the products, their pharmaceutical manufacturing procedure, involve process control techniques and characteristics feature of end product will be presented in details at the time of congress.

Naval Cavity Application of an Indigenous Composite AD (T-591) in Management of Infant Diarrhoea

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Diarrhoea is the commonest infant's encumbrance, causing morbidity and mortality. Pathological evaluation suggest diarrhoeal pathogenesis as either specific or viral.

Post therapy consequent sequelae ie- Anal & buccal excoriation is the commonest association. Though there is a broad range of oral antidiarrhoeal agents but not ensure cure.

Considering the therapeutic uncertainty, contraindication of certain drugs in infancy and presence of maternal antibody in infants, an indigenous composite as naval application was evaluated in 2000 children of within 1 year age with equal number of patients as control on ORS and conventional antidiarrhoeal agent respectively.

Method of application

Thick paste of 1 Gm powder applied every 8 hours at naval cavity and sealed with adhesive tane.

Each 1 Gm of powder constitutes of equal parts of Emblicia officinale, Mangifera indica, Myristica fragrans and cost of therapy.

Result

Study confirms that by promoting water & electrolyte absorption, antispasmodic, antidiarrhoeal, antidysentric and soothing action ensure marked decline in frequency of stool, improvement of faecal consistency, improved sleep and hydration status without any untoward effects.

In addition immuno improving property of Embelia officinale protect the children from fungal & bacterial superinfection. No post therapy sequelae was observed.

Alternatives to Psychiatry

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Psychotherapy is a branch of Modern Medicine which includes psychotherapies of various kinds. The prognostic status of psychiatry is no better than time cure. Such a state of affair brings doubt in the common man whether psychiatry is a pseudoscience or not.

For a clear understanding of the problem we have to examine the concept of disease, etiology and the curative processes envisaged by various systems of Medicine Ayurveda, the traditional indigenous medicine of India with a history of about 2000 years. Allopathy or the Modern Medicine with a history of about 200 years and the system of Nature cure, a later development over Modern Medicine are considered in this paper for analysing its basic concepts about illness and cure.

Ayurveda defines disease as an imbalance in the combination of the constituent elements with which the living organism is made of. The system also refers to the necessity of constant interaction of the living organism with such elements as a requirement to maintain health. Toxemia condition also is stressed in such imbalance concepts.

Ayurveda and Nature cure do not conceive disease as an entity. It is a process of the organism's attempt to come back to the original state of balance or health. The predominance of toxemia in most of the diseases is stressed by Nature cure. But the theory of toxemia cannot explain the problems due to deficiencies in body constituents. Here Ayurveda stands on top amount all the sciences of healing with a clear picture of etiology. But Ayurveda too is adulterated by drug therapy at a later stage of its history.

The organic base of physical and mental disease should be accepted as scientific. The disease symptoms are the organism's attempts to come back to the balanced state. Drugs suppress symptoms and never cures any disease, because drugs only stimulate the body, never get assimilated into it. Cure is possible only by the organism, through its natural way of rectifying the imbalance of constituent parts mostly through elimination of waste products and supplementing required constituent elements by way of natural diet.

A healthy organism is one which is in its perfect natural state of its constituent elements combined in its exact proportion. Organisms in their true habitat are in their perfectly balanced state. Mind or behavior is the expression of physical states. Mental and physical ailments are thus not different, since the foundation of mind is the body itself the curative procedures should be aimed at the body. However body and mind are reciprocally activated. The organism generates mental energy and it is constantly influenced by external mental energy. This is the lease of psychotherapies.

A system of medicine composed of natural means of health is the only remedy over pseudosciences. Ayurveda (in its pure drugless phase) yoga and naturopathic sciences (including a few alternate therapies) are to be amalgamated as a system of Psychiatry. The theoretical aspects and practical implications of such a movement is elaborated in this paper.

Agropollution and Food Poisoning (Health Hazards of Fungal Food Toxins)

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Large number of our food commodities are under the attack of different kind of pollutants such as insecticides, pesticides, fertilizers, chemical effluents, natural toxins etc. They cause damage to kidney, liver and other organs and also bring about slow death.

The problem of nutrition is closely linked with public health. In a developing country like India, where a majority of the population lives below the poverty line, ill effects from contaminated foods are wide spread. Hazards of toxin from contaminated foods caused by bacteria and moulds (fungi) are widely common. In recent past, fungal toxins have been receiving particular attention as they pose serious health hazards and are responsible for a broad spectrum of human diseases.

Fungal invasion of food can result in marked deterioration in its quality and often its outright destruction. Such fungi are capable of producing highly toxic substances when growing on various organic materials including food. These substances, which are collectively known as mycotoxins, have been implicated as causative agents in a number of disease syndromes - mycotoxicoses - in humans and animals.

The precise dimensions of the mycotoxin problem are largely unknown in countries whose climate, and agricultural food handling systems are conducive to mold growth and mycotoxin production in foods. Thus a survey (1975) report from India described acute mycotoxicosis involving 397-people of

whom 106 died in Banswada district (Rajasthan) and Panchamahals district (Gujarat). The disease outbreak was associated with the consumption of maize highly contaminated with a hepatotoxic mycotoxin known as aflatoxin.

Aflatoxins possess the highest carcinogenic potency among the toxins in foods. They are a group of coumarins of extreme toxicity to cattle, swine, poultry and laboratory animals. Among them, B₁, G₁, are highly hepatotoxic (toxic to liver) to animals. The lethal dose of aflatoxin B₁ is 0.564 mg/kg and for G₁ is 1.8 mg/kg. The safe limits are 30 ppb. These toxins are produced by the mold *Aspergillus flavus* and *A. parasiticus* which grow on various foodstuffs. Aflatoxins induce malignant tumors in liver and their higher levels cause acute liver damage and cell death. The toxin can cause human liver cancer.

Since the fungus, *A. flavus*, is distributed both in soil and air throughout the world, infection of groundnuts with *A. flavus* may occur at different stages viz. prior to harvest, during harvest, during post-harvest drying period, transit and storage. Similar problem of aflatoxin production by *A. flavus* in storage and standing crops of maize poses a threat to agriculture in world from time to time. Other fungal toxins are no less harmful to the body of animal.

Control

Mycotoxin contaminated food is consumed by the people due to lack of knowledge and awareness and also for want of alternative source of inexpensive foodstuffs. Despite the fact that appreciable amount of mycotoxins will be minimised during the process of cooking, considerable quantity may still remain to cause harmful effects on human health.

Aspergillus mold and allied genera form a dominant group of microorganisms that produce mycotoxins. Their elimination or removal is therefore necessary from contaminated food. As mold spoilage is a prior evidence of excessive storage of food products, it is obviously essential to reject mold spoiled food. Cutting or scrapping the mold growth from the surface of moldy foods or fruits do not directly lessen the hazards since it has been shown that mycotoxins can diffuse to a considerable extent into foods. Chemical treatment has shown the greatest potential of reducing mycotoxin contents. Most effective control is probably achieved by preventive measures which can minimise or eliminate growth of fungal contaminants on food crops. As mycotoxins are a group of coumarin compounds they are heat resistant but light sensitive to some extent. As such keeping contaminated food articles including oil etc. in bright light for hours may lessen the degree of toxin from it.

Hlt-9

Health - Indian Medicine

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Ayurveda lays great emphasis on the preservation of positive health and prevention of diseases. The various methods which are prescribed in Ayurveda and which were in practice

in ancient India are outlined. Diet plays an important role in Ayurvedic practice. Therefore details about various food ingredients and drinks has been dealt in the paper.

Hlt-10

A Special Technique Shodhana (Purification) used in Indian Pharmaceutics

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In Indian Medicine Mercury, Sulphur, metals, minerals, precious and semiprecious stones are extensively used in hundreds of formulations after it is being purified and incinerated properly into Bhasma form. Conversion of these metals and minerals into pharmaceutically suitable form could be made possible only after the development of *Rasa Shastra* - an independent branch of Indian Pharmaceutical Science, in about 8th/9th Century A.D. and onwards. The processing of Shodhana, Jarana, Marana etc. were developed to convert these into least toxic or non-toxic, highly absorbable and therapeutically effective compounds with a view to make their frequent use possible in therapeutics.

Our aim is to view Ayurveda by scientific approach so as to explain it into its various steps without hampering the principles of Ayurveda. Shodhana is one of the most important techniques of Indian Pharmaceutical Science, for which many heating, disintegrating, grinding and potentiating techniques have been developed.

Present paper deals with the critical analysis of this Shodhana technique.

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The word diet is derived from a greek word which means a way of life. In old days man was considered as one entity. But with the development of modern science and thinking we were dragged towards the fractional thinking of a man. Now a days scientists have found this fractional thinking incorrect and are looking for a better alternative. The same is applicable to the sciences of food and nutrition i.e. dietetics. Today's dietetics is based on biochemistry and is framed as per the convenience of modern medical science. They considered food as a fuel for a machine you can say for a living machine and is run by the laws of biochemistry. The food is nothing but Vitamins, minerals, fats, and carbohydrates. It has nothing to do with mind and emotions. Anyway, today the dietetics is a fast developing branch of science. Separate research and educational facilities are available for the study of dietetics in all most all Indian Universities. The study ranges from the malnutrition, clinical dietetics to the study of diet to be used in space. It is based on the western concept of food habits and nutrition. But now a days Indian as well as western scientist have developed an interest in our old system of food and nutrition

We Indians also have a rich heritage in this branch of science.

Our seer and sages have worked over this for years together and reached some conclusions. We can find detailed description of different types of food and their properties in old Ayurvedic and religious texts. There are some basic differences in the attitude towards diet in Ayurvedic and modern dietetics. In this paper I am going to highlight some peculiarities of dietetic concepts in Ayurveda.

Role of ' Mana ' I.E. Mind in Diet

Here the word *Mana* means mind and its emotions and dispositions or desires. The role of mind in diet can be

classified under 4 sub headings.

- 1) The effect of state of mind on digestion.
- 2) The effect of dining place and circumstances on mind.
- 3) The effect of emotions and desires of cook and servants on food.
- 4) Effect of food on mind.
- 5) The effect of state of mind on digestion.

Diet as a Carrier of medicine

Ayurved is an ecofriendly science of life. It is very near to the nature. Most of the medicines are derived from natural products. Very few chemical processes are used while preparing medicines. For many simple ailments Ayurveda advised to prepare a dietary preparation along with herbal medicines e.g. Twenty eight medicated Gruels (Yavagu) are described in Charak Samhita Sutrasthan like (a) Antispasmodic gruel (b) Anti diarrhoeal gruel (c) Diuretic gruel (d) Anticough gruel etc. Such type of preparations are not possible with modern medicines because of its synthetic nature.

Relevance in today's life

We have a rich heritage in dietetics which is based on long standing experience. It is more suitable and acceptable to our countrymen. It is deeply enrooted in this soil. Many times our food preparations proves more nutritious than any western counterpart. The only thing we have to do is to re-establish and present it with some data and that also in today's language.

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Now-a-days medical fraternity, the patients & common population feel that a vigorous public health action has become necessary to control several cardio vascular, cerebro vascular & renal diseases caused by hypertension. There is a call for global steps on hypertension by Dr. Arunchokalingam, a Biomedical Engineer, Epidemiologist by training & consultant to Canadian Health Ministry.

It is a well established fact that normal blood pressure can boost to even 30 to 40% higher when a person is under psychic pressure like anger, irritability etc. Progressive Physiological changes due to psychic pressure in the body reflect as various diseases & in course of time, it can

create brain hemorrhage too & person can even die.

This phenomena is well described in Srimad Bhagwat Gita as:

*Krodhan bhavati sammoh
Sammohat Smritivibhramah
Smritibhranshat buddhinasho
Buddinashat pranashyati ||2.63||*

Ayurveda describes it as Pragyaparaadha.

In Biomedical model, the grass root cause is called stress, which is a physiological & psychological response of body for adoption to external action, situation or events.

With the objective to study the above psycho-physiological relationship, a random survey was conducted among employees of Bhilai Steel Plant where the employees are subjected to various types stresses. The study is analysed on the basis of *Like Food, Like Mood*. Categorily it is found that stress bearing capacity of Vegetarian employees is much higher than non

vegetarian employees. Secondly the inclination of employees for mode of treatment towards Complimentary Medicines.

Other interesting findings will be discussed during presentation.

Hlt-13 **Documentation of Indigenous Methods in the Management of Mental Disorders in Coastal Karnataka**

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Traditional practioners of coastal karnataka attribute all the psychiatric illness to the derangement of Pitta Dosha. Without going for the details of classification of mental disorders, in this regard, an holistic approach in the management is employed.

Some of the remedies such as pills of Sarpagandha and Yastimadhu or of Dhatura, Shero Lepana of Adambu balli (*Ipomea pescaprae*), Chandana, Bimbi, Kulma (*Machilus mikranta*) and other drugs either singley or in combination, Shiro Dhara of

Kulma (*Machilus mikranta*) etc. are practiced since generations. In this regard some of the procedures like *Adambu Hakuvudu* are worth mentioning. In this procedure fresh leaves of Adambu balli (*Ipomea Pescaprae*) are boiled with milk, grinded to form paste and applied over the head of the patient.

Further details about the method of treating mental illness in an indigenous way and a preliminary documentation of plants used in mental disorders in coastal karnataka are discussed in the paper.

Hlt-14 **Revitalisation of Traditional Health Practices in Orissa**

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Orissa with its diversified flora, vast forests and varied tribal communities has a rich health tradition. Each of the tribal society has its own culture. Traditional health practices of tribals are associated with their cultural life. In certain situation, which are not uncommon, they are exclusive means of combating human sufferings. Cultural knowledge of health practices is survived only by word of mouth from generation to generation. Unfortunately, this knowledge is confined to a handful elderly persons of each community, who want to keep it as guarded secret.

Ethnobotancial surveys carried out by us to document herbal remedies used by various tribal societies in their indigenous health practices since 1982, confirmed that a rich knowledge

of indigenous used of locally available medicinal plants is rapidly sinking into oblivion. It can largely be attributed to acculturation, technological changes, depletion of forest resources etc. We can neither afford to loose nor neglect such a rich knowledge if we are really interested to provide health care at grass root level.

In this communication, an attempt has been made to find out the reasons for degradation of traditional health practices in the state through personal interviews with large number of traditional practitioners and other user resources. Possible solutions to revitalise traditional health practices have been suggested for its viable and sustainable growth.

Hlt-15 **Comparative Pharmacognostic Studies on the Roots of Genuine and Commercial Samples of *Trianthema Decandra* Linn**

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Trianthema decandra Linn. (Fam. Ficoidaceae) commonly known as *Vellai Sharunnai* in Tamil and *Punaravi* in Sanskrit. The leaves, roots and root-bark are used for curing various ailments. The roots are used in hepatitis, asthma and suppression of the mensus. Root ground up with milk is given

for orchitis. The genuine and local commercial samples of the roots of *Trianthema decandra* linn. have been compared pharmacognostically in the present investigation. Microscopic characters of the root of *Trianthema decandra* linn. has been performed. Fluorescence characters, ash values, extractive val-

ues of the genuine and commercial samples in various solvents have been determined and compared. Preliminary phytochemical analyses of the extracts of the root powders in various solvents have been performed. Thin layer and paper chromatographic studies have been performed for the various extracts

of the samples and the Rf values have been measured in the best solvent system and compared. All these pharmacognostic findings reveal adulteration in the local commercial sample. These findings will be discussed in detail.

Hlt-16

Prevention and Treatment of Cancer by Dietary Habits

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Preventive and curative measures taken by the modern system of medicine in cancer are not perfectly successful because of their limitations with drastic side effects. Even the recent cis-platin group of compounds used in the chemotherapy of cancer are not giving satisfactory results, wise nutritional habits will now a days suffice to keep the body cells in the state of normally which the surest protection against their becoming malignant. It is evident from the literature that the plant products rich in potassium and iron protect the general immunity system of the body and from cancer in particular. Therefore there is a very possibility of the prevention of cancer by the manipulation of our dietary habits.

Herbal drugs have been in practise to cure cancer since time immemorial. Ebers Papyrus (1150 B.C) for the first time recommended garlic in the treatment of skin cancer. Later, Hippocrates (5th Century B.C) recommended eating garlic for uterine and abdominal tumors.

Prevention and treatment of cancer with herbs will be much beneficial because of the lack of their sedentary side effects. In this paper some of the important herbs which can be used as diet and remedies in the prevention and cancer have been discussed.

Hlt-17

Treatment of Gridhasi Roga (Sciatica) by Agni-Karma- Chikitsa (Therapeutic burning)

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Susharuta described the treatment of Surgical disorder by Shastra Karma (Treatment by sharp instruments), Kshara-Karma (Treatment by application of Kshara), Agni-Karma (Treatment by producing therapeutic burns), Bheshaja-Karma (Treatment of vrana etc. by applying medicines), Raktamokshana (Treatment by blood lating). But he says that Agni-Karma is useful in the diseases which are not relieved by Shastra-Karma, Kshara-Karma, and Bheshaja Karma. He assured that the diseases treated successfully by agni-Karma have no recurrence (Su.Su.Ch.12/3)

By producing Bindu-sized Samyaka-Dagdha-Vran with pancha-dhatu Shalaka, Agni-Karma is result oriented, and having minimum complications.

The Agni-Karma is useful in the diseases which are produced by Vata or Kapha dosha.

In the present study the patients of Gridhasi Roga which is one of the Vata Roga, were selected from Pakvasa Rugnalaya, of Shri Ayurvedic College, Nagpur. 37 patients of Gridhasi Roga (Sciatica) were treated with Agni-Karma. Method of Agni-

Karma used is as follows:

Agni-Karma Chikitsa Upakrama

- (1)Purvakarma (Pre-Operative Preparation): Proper preparation of patient, Shalya-Karma-Mandira (operation theater) was observed. The Shalya Chikitsa Nurces became ready for Chikitsa. The instruments were collected. The shalya made red hot on the Gas-flem.
- (2)Pradhan-Karma (Operation Proper): By red hot pancha-dhatu shalaka the samyaka dagdha vrana were produced in 2 to 3 seconds time, on Kati-pradesha (lumber region), Uru-pradesha (Thigh region) Jangha pradesha (Leg region) and Pada pradesh (foot & ankle region). Charaka described that these regions.
- (3) Pashchata-Karma (Post-operative Management): After Pradhana-Karma the pralepa (application) of Kumari (Aloe & India Royle) swarasa was done on the dagdha vrana to reduce the burning pain produced by Agni-Karma.

Himeshwari Sekar

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WHO (World Health Organisation) defines Health as a *Physical, Mental and Social well being*. But Modern Society enjoy only skin deep health. Nature Cure finds a way for complete health.

This is the age of Computers and Electronics.

Scientific equipments have become a part and part of human life. This material progress of Science has made life easy and comfortable. One cannot enjoy these comforts of life without good health.

Medical Science is far advanced. Even a face or body shape of a person can be changed, organs can be transplanted. Despite of these developments in the medical field, diseases are increasing day by day. Two out of three persons are suffering with some chronic health problem.

Pondering deeply makes one understand that Medical System tries to give immediate symptomatic relief. It ignores to think the root cause of disease. As a result externally the symptoms alleviate momentarily but disease becomes chronic and complicated. Increasing rate of killing diseases like AIDS, Heart Attacks, Cancer etc are threatening humanity. Dependancy and side effects of medicines makes people to feel insecure about health. The cost of treatment is beyond the capacity of common man. Medical Science could not promise health to humanity and achieve *Health For All*.

In Nature, one finds, no prolonged disease. Rarely do the animals and birds fall sick. Even if they get an illness it is only for a short time. During sickness, they rest, avoid food, wash themselves in water, roll on mud, expose to sun, eat some leaves and get well. They seek neither doctors nor medicine, but nature heals them.

Man runs behind the best doctors and search world wide for best Medicine. But Nature's Supreme doctors are Earth, Water, Sunlight, Air and Ether. They are available everywhere. They treat in a simple, safe, economical way and give permanent cure. Nature has gifted the all powerful medicine inherent within every one. It is the self-curative power. It is also called as vital energy or Bio-energy. This bio-energy protects the body from diseases. It makes the system to function in a systematic way according to the biorhythms of Nature. It constantly purifies our cells and keeps temperature, Bp, pH of blood and various elements and secretions at required level. The wastages are eliminated regularly through lungs, skin, large intestine and kidneys.

The self curative power within the body is constantly recharged by the five great elements, Earth, Water, Fire, Air and Ether

which are called as *Pancha Boothas*. Recharging is possible since the basic components of human body are the same five elements. Both the human body and World comprises 2/3 of Water. There is heat inside and fire outside. There is Oxygen in the body and in the atmosphere. Thirumoolar, a great Siddha has rightly put it as *Andathil Ulladhu Pindathilum Undu* which means body has same elements, as in Universe.

Body when well balanced with these five elements, is in a pure state, is full of energy and healthy. Then no germs can attack it. When impurities or wastages accumulate in cells, their normal function is distributed. The five elements of body get imbalanced. Impurities and imbalance attract bacterias. Human body reacts to this and activates the self-curative process. Body's normal functions like digestion and other activities are suspended temporarily. Body refuses food, forces itself to rest and falls sick. Thus total energies are concentrated towards purification. Once it purifies the body from foreign elements, it regains health and energy. In short sickness is a cleaning process of Nature.

Patients are treated in *Nature Cure* by way of Fasting, natural and simple diet, and by using hydrotherapy, Mudtherapy, Chromotherapy, Magnetotherapy, Massage, Yoga and with right mental attitude and by changing habits and life style.

All these therapies aim at purifying, recharging and strengthening and assist nature in healing.

Natural food provides plenty of Vitamins, minerals, and fibre. It gives strength for healing process.

By natural treatments and yogic exercises

- *Circulation is improved
- *Glands are stimulated
- *Organs are strengthened
- *Stress is reduced
- *Nerves, Blood-vessels, and tissues are freed from all undue pressures.

By improving the total Health, nature cure gives no way for diseases. It is preventive as well as curative. By living in accordance to Natural Laws *Health for All by 2000 A.D.* can be achieved.

Hlt-19

Concept of Shat Kriya Kala in Ayurveda

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The Physician who fully knows about these six kriya kalas alone is entitled to be called us a physician - Sushruta

The Kriya Kala literally means the time of action. The concept of Kriya Kala refers to on unique approach of Indian Medicine to the understanding of mode and stages of diseases process. It is very essential for early diagnosis, Prognosis and for adopting preventive and curative measures.

Sushruta, the father of Indian Surgery has vividly mentioned the pathological approach to the concept of Kriya Kala, where six possible stages of disease have been identified. They are-

- 1. Sanchaya (Accumulation)
- 2. Prakopa (Provocation)
- 3. Prasara (Propagation)

- 4. Sthana Samshraya (Localization)
- 5. Vyakti (Manifestation) and
- 6. Bheda (Complication)

This approach primarily aims to detect a disease early and to institute an appropriate measure to control the further progression. The concept of Kriya Kala has been developed in relevance to the fundamental Tridosha Theory of Ayurveda.

A detailed account of the above concept as described in Ayurveda and its relevance in the present Medical Education and practice will be put forward in the paper presentation.

Hlt-20

Management of Traumatic Wounds in Ayurveda

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The knowledge of Traumatology is essential for all surgeons. The incidences of Traumatic or Accidental wounds are commonly seen in daily life. Among all Ayurvedic classics, Sushruta Samhita is the only treatise which deals exhaustively, methodically and logically with the surgical procedures in Emergency conditions.

Sushruta described six types of Traumatic wound caused by various weapons of sharp edges in the different parts of the human body. They are

- 1.Chinnam (Excised wounds),
- 2.Bhinnam (Deep Punctured wounds of a cavity)
- 3.Viddham (Pierced wounds)

- 4.Kshatam (Lacerated wounds)
- 5.Pichchitam (Contusion) and
- 6.Ghristam (Abrasion)

The injuries of Head, Neck, Thorax, Abdomen and Limbs have also been included under Traumatic wounds.

The management of Traumatic wounds includes Haemostatic Appliances, Surgical Procedures, Suturing techniques, Bandages and External Medicaments.

This paper will deal with the different types of Traumatic wounds and its management.

Hlt-21

The Biological Standardisation of Ayurvedic Drugs

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The pharmacological activity of certain Ayurvedic drugs has been applied to their evaluation and standardisation. Assays on living animals as well as on human beings often indicate the strength of the ayurvedic drug or its preparations. Since living organisms are used, the assays are called biological assays or bioassays.

Rats or mice are used in biological assays to ascertain the efficacy of the drug as well as the toxicity of that Ayurvedic drug. A series of different animal species from rhodents to mammals may be necessary for the complete evaluation of one drug or preparation.

Human beings have long offered a means of noting the activity of Ayurvedic drugs. Most of the Ayurvedic drugs are proved

by Ayurvedic physicians to be nontoxic. We learn from Ayurvedic literature that the physicians themselves conducted animal studies in cow, goat etc.

But taking the drug internally needs a thorough toxicity study on at least four different animal species from rodents to mammals (rat, mice, rabbit, monkey) to prove the scientific community whether the drug is toxic or not. For external applications of Ayurvedic drugs, a detailed clinical evaluation on human beings directly is enough to prove its efficacy.

The oil and ointment prepared from the plant *Wattakaka volubilis* (vattakkakkakodi) is found to be effective in contusions, sprains, strains, boils, abscesses, bed sores, wounds, dry skins ichthyosis etc.

The clinical effect of *Leucas aspera* (Drona pushpi) oil for psoriasis is also being carried out in the above department. The clinical effect of *Wattakaka volubilis* and *Leucas aspera* on different dermatological conditions and their antibacterial and antifungal action is the subject of this paper.

Hlt-22

Sidha Maruthuvathil Kayakalpa Muraikal

T.Arvind

Govt. Sidha Medical College, Palamkottai

This paper deals about the maintenance of body with the basis from sidha medicine. It describes about the types, medicines and the herbs used in maintaining the body. Some yogic methods practiced by sidhars also are given.

Included as paper no: 12 in the Tamil section

Hlt-23

Irubathiyoram Nootrandil Indhiya Maruthuvam Indian Medicine in 21st Century

P.Balu

TMSRC, Salem

This paper deals with the status of Indian Medicine in 21st century. Advantages and suggestions needed for Indian Medicine are dealt here. He says, by following Indian Medicine you can live long without any medical ailments.

Included as paper no: 13 in the Tamil section

Hlt-24

Sidha Maruthuvathil Noyanukavidhi How to Prevent Disease? from Sidha Medicine

S.Indhira

Govt. Sidha Medical College

This paper narrates about the superiority of Sidha Medicine. This also deals about the practices given in the Sidha Medicine to keep our health normal and healthy.

Included as paper no: 14 in the Tamil section

Hlt-25

A Study on the prognosis of prameha (Diabetes Mellitus) on the Basis of Insulin level of the Body

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The Ayurvedic Classics have described the prognosis of the diseases & accordingly advised the treatment. In the context of Prameha, it has been described that Kaphaj Prameha is Sadhya, Pittaj is Yapya & Vataj is Asadhya. To prove it on the

level of insulin, a hypotheses has been proposed that there may be hyperinsulinism in Kaphaj Prameha, hyperinsulinism in Pittaj Pramehi & ainsulinism in Vataj Pramehi.

Material & Methods

40 cases of diabetes mellitus were diagnosed according to WHO criteria & were grouped into 3 categories i.e. Kaphaj, Pittaj & Vataj according to their Deha Prakriti each having 18, 12 & 10 cases respectively. Their sample for insulin was taken at 1/2 an Hr. after ingestion of 75 gm of glucose at fasting state.

The insulin was assayed by *Ria Method*.

Observations & Result

The mean insulin level in Kaphaj group was 49.21 uU/ml & 18.39 uU/ml in Pittaj group. In Vataj group it was 9.51 uU/ml.

Conclusion

As suggested by insulin level, in kaphaj group, the response of treatment will be better, good in Pittaj group & poor in Vataj group which is true according to the description in the text.

Hlt-26

Health Care Products

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Health Care Products have been described in detail in ancient Ayurvedic Literature (An indigenous system of India for using Herbal Medicines). They are mixtures of exotic herbs prepared in those days by court physicians for king's households. The combination of herbs selected would impart following effects:

Cleaning of the skin of extra sebum, secretions and dirt. This is accomplished by natural *Saponins*. They would also open up the sweat gland ducts resulting in normal perspiration.

Astringent Action: Astringent action of other group of herbs increase the vascularity of skin which imparts the glowing quality of the skin.

Natural perfumed oils of the exotic herbs lend a smooth texture. The oils penetrate the epidermis partly, leaving a day long mild natural perfume.

Natural Antibiotics of the another group of herbs kill the Saprophytic bacteria which impart of foul body odour.

Excessive tanning of the skin induced by ultra violet rays can be prevented by few herbs.

The senile changes in the skin (Ageing) which lead to wrinkles, dry parched skin which has lost its youthful luster can be prevented by few herbs which are called *Free radical scavengers*. These herbs maintain a normal distribution of subcutaneous fat which prevent wrinkling. The age related changes in skin structural proteins are prevented by these herbs. This leads to a taut, lustrous skin.

Herbal combination designed for scalp hair.

Cures dandruff.

Prevents hair falling.

Increases thickness (body) and luster of hairs.

Prevents pre-mature graying of hair.

Exotic Herbal combination is designed for pubic and auxiliary hair. This makes the hair soft and perfumes the same.

Formulation for following health care needs which depend on above mentioned effects.

1. **Body Lotion:-** A combination of herbs imparting smooth texture and lingering natural body perfume.

Use :- To be used after cleaning the skin with natural saponins or soap. Apply the lotion for 10-15 minutes and wash it later with warm water.

2. **Face Pack:-** The herb combination would have mild saponification & astringent effect.

Use :- To be applied as thick paste for 15-20 minutes and washed with warm water.

3. **Herbal Mouth Wash:-** Prevents growth of oral bacterias which cause Halitoses. Perfume bearing herbs impart feeling of cleanliness and fresh breath.

4. **Acne Lotions:-** The herbs will have astringent and saponification effect. They would prevent growth of saprophytic bacteria and cause healing without scarring.

Use:- Apply at bed time all over the face. To be cleaned with warm water the next day.

5. **Anti Acne Tablets :-** Are oral preparations which have similar systemic effect. It acts as an oral skin tonic.

6. **Anti Dandruff Oil/Shampoo :-** The herb combination

a. Prevents excessive drying of the scalp.

b. Inhibits the growth of dandruff causing fungus viz *ptyrosporum ovale*.

7. **Hair Conditioner :-** Adds extra body and luster to the hair due to increase in width of hair cortex. This guards the core proteins from damage by heat, chemicals etc.

8. **Hair Oil:-** This prevents hair falling along with conditioning.

Products used in general disorder

1. **Aphrodisiac oral tablets**

Provokes desire, sustains, and thus enhances sexual performance.

2. Aphrodisiac topical cream.

Leads to a warmth generated from groins to the organ which hastens erection and sustains it.

3. Breast enlargement: Oral tablets.

A tonic for females which increases the supporting adipose tissue of breast making the breast firm & full.

4. Breast enlargement topical lotion.

Increase breast size, the mode of action of which is not mentioned in Ayurvedic literature.

5. Anti Eczema & Allergic Tablets & Topical Cream.

6. Anti Diabetic Tablets.

Hlt-27

Incidence of Sandhivata in Ardita cases

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Maharishi Charaka has termed Ardita, a different entity than Pakshavadha: (1) And also has not limited to kukhardha only. (2)

He has further categorically stated that the four entities unlike Ardita i.e. Ardita, Apatanaka (Antarayam, Bhayayam & Dandaka). Hanustambha and Akshepaka are relieved of the attack except Dandaka in due course of themselves, may leave behind udarks. (3)

The main samprapti factor in shiroroga is Rakata Dushti. (4) as is stated in Keeyanta Shirasheeya chapter and Trimarmeya Siddhi chapter and has main localisation - sthan-samsraya in head i.e. Mashtishka-Brain.(5)

Potential vitiation of vayr (6) in Ardita is of obstructive type and mostly is caused by Ama (7).

Pranvayu in its Moolasthan i.e. shiras, a seat of all eleven Indriyas. (8) controls all the functions of body upto paramanu level.

Though its activities, functions, are enacted by Dhatu upadhatu and srotas composed of it. (9).

Utkhapan, Apakshapan, Akunchana, Prasarana, Vivartana, Gamana like functions are attributed to karmendriyas has Urdhava, and Adhoshakhas performed by Asthisandhi, Sleshaka Kapaha, Snayu, Sira and Kandaras. Vitiation in one or more sites, is responsible for hyper, hypo or uncontrolled functions for which we are expected to note sthan and Dushya of Pradhan-Sanchari Samprapti (10). As we are again expected to treat the diseased with special methods according to site and Dushya i.e. Dhatu-Updhatu (11).

According to prasar, it is mostly generalised samprapti i.e. Margaga with localised, manifestation i.e. Sthan Samsraya in masishaka effecting Gyanandriyas and/or Karmendriyas; dup to Rskta Dushti. (12) A site of Khavaigunya. Further it may spread as Sthanastha Dushti. (13) involving near by Dhatu, Ashaya, Kala, Srotas etc. hampering respective functions.

As Ardita is mostly of Nija type, assessment of Poshak Doshas is necessary as other four types of Doshas are nourished by Kledaka, Kapaha, Pachaka Pitta & Apan Vayu evolved during three avasthapakas (13) and as Dhatisagnis are responsible to

Jatharagni for proper functioning. (14) The disease entity cannot be cured without proper functioning of poshak doshas in Mahasrotas. Though there is no specific mention of Apan vayu, nourishing other four types of vayu. The principal seat the vayu is attributed to Apana site.

Hence for assessment of vyadhibala, potency of sign and symptoms, and sites involved is necessary; for this the routine followed is every case in Shri.Dhanwantari Ayurved Prathishthan Nanded Maharashtra is as follows:-

1. Jatharagni - (15) :

Intake - Quality & Quantity of food (Sarvagraha-parigraha)

Samskaras

Mixtures

Rules of Intake followed: Jaranshakti is assessed by examining the three avasthapakas, with the help of signs-symptoms and palpation, percussion and Auscultation of abdomen.

Physical examination of complete quantity of stools along with physical, chemical & Microscopic examination in Laboratory.

The end Mala Product of three Avasthapakas is stools which is expected to be well formed with foetish odour, quantity ranging from 150 to Gms. and which floats on water.

The abdomen after passing stools should be soft. (16)

2. For pakwashaya Samutha, time of getting out of bed and passing of urine & stools is noted. It is expected to get out of the body in Bramha Muhurta without help of tea, Tobacco, Yogasanas etc.

3. In srotas examination routine examination of Pranmoolasthan functions of Indriyas is conducted as usual.

Rasavaha-Raktavaha Srotas is investigated which special reference to Heart your spleen etc.

In Mansa-Medovaha Srotas examination special investigation of Blood pressure for evidence of Dhamani Prathichaya and Snayu karma bala is investigated.

Examination of Asthivaha Srotas, involvement of joints for Sandhivata-Vatarakta can only be assessed by the Vaidya examination with the help of various Yogasanas.

As the patient himself is unable to perform Karmas like utkshepana, Apakshapana, in Ardita and Sandhivat, detection of Sandhivat is possible only when the physician helps the patient in the Yogasanas.

Yogasanas acts as Parameter for the detection, assessment, treatment and also prevention of the attacks. Due to mobilisation of joints.

We have come across more than 45% of cases of Ardita having Sandhivat mostly of Sama state.

The treatment in this state of disease definitely differs according to principles as brimhan, Abhyana, Swedan (Pinda Sweda-Pizichi) can only be introduced along with Medhya Rasayana after the patient of Srotoradha with the help of Pachan-Shodhan treatment.

A detailed data according to age, sex, involvement of various joints gradation along with avasthachikita will be submitted during the discourse.

Hlt-28

Community Based Traditional Primary Health care

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Introduction

BAIF Development research Foundation, Pune is working in the field of rural and tribal development for over twenty five years. The focus has always been on developing sustainable income generating programmes. An experiment to develop sustainable traditional primary health care system was done. The experience was encouraging. The salient features and findings are proposed to be present in this paper.

Material and Methods

The experiment was conducted in two operational areas of BAIF Development Research Foundation. They are situated in tribal belts of two western states of India, namely Akole Tahsil of dist. Ahmednagar Maharashtra, and Vansda Tahsil dist. Balsad of Gujarat. The tribals in these areas are participating in integrated tribal development programmes of BAIF. 'Wadi' is a core programme which provides livelihood to participating tribal families.

The specific tribal communities in the area are Thakars, Koli, Kolcha, Kotwalia, Kukna etc. The traditional health practices are prevalent in the area. It was noted that the tribal communities believe in these practices and they would prefer to use them for community based primary health care.

A survey to identify and document the prevalent traditional health practices was carried out. The practices were referred to specialists and validated by finding suitable references in the texts of traditional systems of health namely Ayurveda. A package of validated practices was the outcome. The participants and providers of the data were brought together, in meetings and gatherings. Experts were also invited. These were conducted at the village level. Confidence in self reliance, primary treatment and identifying risk to build up referral system was raised. However, the participants especially the women expressed the need of specific training and demonstrations. This was mainly because the systems used a number of medicinal plants after primary processing. On undertaking this

it was thought to provide inputs, training and monitoring for a period of 6 to 18 months.

Results and Discussion

It was observed that the specific community namely Thakars have more knowledge of traditional health practices. It was also interesting to note that women were participating with more enthusiasm. About 50 traditional practices (medicine plants) were noted which could be used in primary treatment. The required plants were found in the same geographical area. They could be grown in backyard herbal gardens along with other vegetables.

Training were required to be planned periodically and methodology opted was informal. The demonstrations and do-it-yourself was the best method to ensure correct passage of training. In the area over 2,500 backyard herbal gardens were developed over 400 people were trained. They were also trained to prepare simple herbal formulations like 1. powder of lemon grass, shunthi, liquorice 2. Kalmeghadi wati, 3. Medicated hair oil, Neem oil, etc. It was possible to make them confident about market potential of herbal medicines. The referral was linked with existing system of Govt. P.H.Cs. However less people needed it.

Conclusion

The specific communities are having wealth of traditional health practices, the wealth could be utilised to develop a package of traditional primary health care system. However the role of specific training programmes cannot be denied. The education in identifying risk is also a must. This assisted by input supply for cultivation of required medicinal plants in backyard herbal garden also helps in reducing dependency outside the area and agents. Withdrawal of support after a period of one year or more doesn't collapse the system. To conclude we pledge Govt. and Non-Govt. agencies to undertake this work to provide more efficient and self reliant, community based traditional primary health care even in remote areas.

The Pharmacognostic Study on Roots of *Strobilanthes callosus* / *Carvia callosa*

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Strobilanthes callosus* / *Carvia callosa (Fam: Acanthaceae) commonly known as Karvi, found in the Western Ghats of Maharashtra, Konkan & Central India, under which we are studying the external morphology (occurrence, collection etc.) internal morphology (study of transverse section including micrometry), physico-chemical study (proximate analyses, extractive values etc.), pharmacological evaluation of different

extracts of the roots (effects on heart & smooth muscle, analgesic activity, anti-inflammatory activity etc.)

Currently evaluation of anti-inflammatory activity & isolation of the chemical constituents is under progress. These roots have been found to contain Lupeol, a triterpenic saponin.

Stress and Ayurveda

L. V. Kortikar

With the help of science man got victory on Nature & Diseases But...

If man is happy?

If he is breathing quietly?

Transportation became easy but if tuning of mind is there?

Productions are increasing but what about tranquility?

We got control on epidemics but if our body became strong?

Behind this progress some problems are coming slowly in our life. New enemies are waiting for attack!

Due to this enemy man didn't die quickly but his body damaged slowly. He loss the urge to live wonderful life.

The modern civilised man creates a new enemy, the most dangerous called as... *Stress*.

From womb to Tomb we are under stress.

So many psychosomatic disorders are increasing just because of stress eg Hypertension, peptic ulcers.

Bronchial Asthma etc

Scientists all over the world are doing extensive research on stress.

Surprisingly in Ayurveda we can get good solution about stress & stress induced diseases. Panchakarma therapy, Rasayanam therapy, Achar Rasayanam, some Herbomineral drugs. Yoga therapy is very much beneficial.

A Study of Lekhaniya Effect of Haridra (*Curcuma Longa*) and Chitrak (*Plumbago Zeylanica*)

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The clear cut indications have been described for herbal drugs in the ancient texts. The Lekhana karma of Haridra and Chitrak is also this type of indication narrated in Charaka Samhita. Lekhana is a process of *Patalikaranam* - emaciation or *Dehavishodhanam* - desiccation. In this context patients of

medovridhi i.e. Obesity were taken for the study to assess Lekhana karma of Chitrak and Haridra. The paper deals with the study of Chitrak and Haridra with reference to its Lekhaniya property on the basis of different clinical and biochemical parameters.

Effect of Yogic Practices on Low Back Pain

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Low Back Pain is one of the most common ailment of modern man. It has been estimated that about 90 per cent of the

population on some occasion during active life, will suffer low back pain for long periods of time. Twenty two women aged

25 to 45 years working in Administrative office in the University of Jyväskylä (Finland) were selected as subjects. They were suffering non specific lumbar back pain (LBP). All the subjects were administered spinal disorders questionnaire, low back symptoms questionnaire mood variables and selected spinal mobility variables before and after the experiment. The

yogic training programme (Selected Asanas and Pranayams) was kept only in the evening one hour everyday except Sunday, for a period of six weeks.

After the experimental period the back pain was reduced.

Hlt-33 **Role of Biostatistical Methods for Research in Indian Systems of Medicine**

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The medical systems that are strictly Indian in origin and development are the Ayurveda and the Siddha. While the former is practiced throughout India, the latter is practiced in the Tamil speaking areas in south India. The Arabian system of medicine, known as the Unani system - originated from Greece - was introduced by the Muslim rulers in India around the 11th century and became part of the Indian Systems of Medicine (ISM). All these systems along with the allopathic system which was introduced during the early part of the last century for the benefit of the British rulers and officials exist now. However, most of the allopathic practitioners serve in the urban areas which contain only 25% of the total population of India. The National Health Policy of 1983 pointed out that the entire basis of and approach towards medical education & training at all levels must be reviewed and restructured in terms of national needs and priorities. The importance of initiating research in ISM was emphasized as early as 1916 by the Director General of Medical Services and later during 1950 -

51 by the C.C.Pandit Committee. Since the First Five year Plan the Government of India allocates a proportion of its budget for development of ISM. The Eighth Five Year Plan in its strategy for the promotion of ISM realised the need for provision of adequate facilities for research in ISM. There are more than 100 undergraduate teaching institutions in India awarding a degree in Ayurveda/Siddha/Unani following training for 4 1/2 years. Nearly 1600 ISM hospitals and 13000 dispensaries exist in our country. The Indian Council of Medical Research (ICMR) was the pioneer in the pharmacological and clinical evaluation of ISM drugs and was the single body responsible for this work during 1960 - 70. Its efforts have been concentrated towards validating ISM drugs. The Tamil Nadu Dr.MGR Medical University has affiliated colleges of different systems of medicine and formed three faculties for research in Siddha, Ayurveda and Unani. In terms of these strategies, this paper attempts to throw light on the uses of Biostatistical methods for promoting research in ISM.

Hlt-34 **Pharmaceutical standardization of Kupipakwa Rasayana with Special Reference to "Swarna Vanga" in Indian Medicine**

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Ayurveda is ancient science of life and it is complete scientific Medical System. Apart from the Astangas of Ayurveda, the Rasashastra and Bhaishajya Kalpana, which was developed in the later part, has been contributed much in the field of Pharmaceutical sciences to combat chronic diseases successfully.

In Indian Medicine Kupipakwa Rasayanas are considered as the most important Pharmaceutical preparations for their therapeutic effectiveness. As the name indicates these preparations are prepared in a kupi (glass bottle wrapped with cloth smeared in mud) by applying heat with valuka yantra. Amongst Kupipakwa Rasayanas *Swarna Vanga* is one of the most important mercurial preparation indicated for wide range of therapeutic

uses. Till recently it was being prepared by Valuka yantra system of heating, where heat is applied through wooden fire. But in this method of heating we can not control the temperature as per our requirement and there is much loss of heat. Thus with the view to avoid these difficulties a vertical type muffle furnace has been designed, through which standardization of heat and time could be done easily.

The method of preparation of *Swarna Vanga* as per formula given in the texts has been prepared by using muffle furnace, the heat and time was standardized. All the details will be discussed at the time of presentation.

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Introduction

The classics, which exclusively dealt with personal or Public health care, have not come to limelight in ancient literature, though the ancient Indian Medicine, Ayurveda has eight branches according to the diseases. The subject of Hygiene was not treated as a separate subject.

1. Kayachikitsa - Internal Medicine.
2. balatantra - Paediatrics.
3. Grahachikitsa - Means of restoring the deranged humours supposed to be caused by demonical possession etc.
4. Shalakyatantra - ENT and Ophthalmology.
5. Agadatantra - Toxicology.
6. Rasayanatantra - Rejuvenation therapy
7. Vajikarana - Aphrodisiacs.
8. Shalyatantra - Surgery.

Hygiene was however, a subject of both religion and medicine. The traditional method of health education was imparted through non-medical texts like Puranas, Shastras and treatises on polity and morals.

Health Care & Hygiene

The excavations at Harappa and Mohenjodaro bear ample evidence to the proficiency reached by the people of the Indus Valley Civilization in the matters of sanitation and hygiene. Harappa and Mohenjodaro cities represent the oldest examples of town planning in the world. The houses were provided with modern amenities there were baths, lavatories, drains fresh water tanks, courtyards and bed rooms etc. The main drains could be cleared by lifting large, specially made brick manhole covers the whole concept of town planning shows a remarkable concern for sanitation and public health which was, perhaps, without parallel in those days the soakage pits took the eventual sewage.

Ramayana (Srishtikhanda of Padmapurana) literature refers to some of the health care methods which are related to the science of medicine (Ayurveda).

The story of Rama going to the forest and spending some time in Pushkara theertha is narrated. There Rama performed one Vrata (Vow or religious observance) known as *Kayashodana* (Procedures are not found). Literally the word *Kayashodana* means cleansing and purification (by evacuation of faecal material) of the body. This idea may be periodical thorough check up intended to eliminate the abnormally increased doshas and restoring normalcy by adopting procedures such as vomiting, purgation, blood letting etc. by observing strict

dietetic regimen and such other activities.

There are evidences, on the health care of ancient Indian Scientists about the prevention of Water borne epidemics like Cholera (Vishuchi). The disease Cholera is described as Vishuchi, which cause devastating Scourge described as *Janapaddhvamsa* (communicable) in Charaka Samhita (3rd Century B.C. (Su. VI; 39). The ancient scientists observed that the water borne diseases could be prevented by consuming only boiled and cooled water especially in a rainy season.

Sushruta (6th century B.C.) stated the fundamental principles of spread of water borne epidemics. The Sloka (Su. Su. VI, 11) elucidates the idea that the soil gets contaminated with faecal material and gets washed in the rainy season, and thus the filth may be carried by the water. In the rainy season the water must be boiled and cooled before consuming the water for drinking purposes, as stated in Charak.

Treatises on polity like Arthashastra also contain portions on hygiene, though stress was given for the maintenance of the health and protection of the life of the king.

According to Pettenkofer, who was also the Chairman of Cholera Commission of the German Empire 1873, notified that investigations with reference to topographical features, dwelling, dress, diet, occupation, sanitation, water supply etc. supply of pure drinking water was important. In this context the recommendations of Cholera Commission are similar to the ancient Indian Medical Scientists of 5th and 3rd century B.C.

Charucharya (Rules of good living or personal health & Hygiene) written by Bhoja Deva compiled by king Bhoja of Paramara dynasty, who ruled over the kingdom of Dhara in the 11th Century A.D. (1000-1055) and it was translated into Telugu by Mantri Appanna in 13th or 14th C. A.D. The text deals with rules and regulations to be observed in daily life beginning from the time of getting up from bed in the early morning upto the time of going to sleep at night. It is interestingly to note the existence of a treatise exclusively devoted to personal hygiene, belonging to the medieval period.

Conclusion

The ancient traditional medical sciences has given a comprehensive account of the mode of living and rules of desired conduct to be followed by every body desirous of good and happy life. The traditional medical sciences played a great role in the health care. The Indian treasury of medical knowledge is put in to practise since Vedic era and honoured by the people till today.

A Need of Networking Conservation of Indigenous Medicinal Plant Species

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The indigenous medicinal plants are valuable in ayurvedic and Unani systems of medicine for their therapeutic uses. In rural India medicinal plants are traditionally used as home remedies for treatment of various body ailments from generations to generations. It is a part of our culture and heritage.

At present trading of medicinal plants has enormously increased. The constant extraction of medicinal plants from their niche through unscientific harvesting, poaching, encroachment of forest land for agricultural use, destruction of habitats and deforestation has extensively affected the medicinal flora. Moreover increasing monoculture in forests and agricultural lands appears to be a major threat for the sustenance of medicinally important plant species. The changing climate and

rise in global temperature may possibly affect the flora adversely. Despite their immense value very meagre efforts are made for protection, propagation and conservation of wild species. The number of threatened and endangered species of medicinal plants is increasing because of human compulsion and his apathetic view towards nature.

The Peth-Harsul Tahsil of Nashik District which covers ranges of Western Ghats was selected for surveillance studies. This area was known for its richness in the diversity of medicinal plants. The present status of medicinal plants from this area, the probable causes of depletion are highlighted and the strategies for their conservation are discussed.

Therapeutic Nutrition in Ayurveda

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Food is the fuel for life. Health is maintained by regular and rhythmic intake of food. A disease is the end result of continuous indulgence in irregular and un-wholesome food. Health and disease is sourced in food. This unique concept bias made food to share one third of Ayurvedic Therapeutics. Besides the nutritional aspects, the curative aspects of food are duly high-

lighted in Ayurveda.

The role of food in causation and treatment of a disease can be considered as *Ayurvedic Therapeutic Nutrition*. Details are discussed in main paper.

Importance of Ayurvedic Medicinal plants

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Importance of Ayurvedic Medicinal plants and its search with latest technology from standardization, cultivation, collection to Pharmacy and use with specific examples to suit modern

civilization, a contribution of Traditional Sciences to Modern living.

Tribal Health practices - Identification of Medicinal Value of the common plants - A Study

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India has a rich source of thousands of medicinal plants with glorious history and status pertaining to the field of ayurvedic science. In our country different kinds of plants are being used by the people in different ways for curing of several diseases and attaining of good health. Likewise the tribal people are using different kinds of plants for curing their diseases and promoting their health status and well being. We may mention

that today the medicinal value of some plants which are used by the tribal people is not known to the doctors, medical scientists and other researchers. Keeping this into consideration an attempt has been made to know the tribal health practises, identification of the medicinal value of the common plants of the tribal areas.

For this purpose ten tribal villages, which are located in the area of Godavari belt of the Andhra Pradesh, has been selected and studied.

This paper reveals that about 75 medicinal plants (including trees, plants, shrubs, herbs, creeps, etc.,) and their parts are used for curing different diseases by the tribal people.

Hlt-40

Child and Yoga

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Child is the father of the man - William Wordsworth

Of all created things, the loveliest and most divine are children. -William Canton

Men do not die; They kill themselves. - Seneca

When all the species, the birds, the animals etc except the man makes their life dance with ecstasy every moment, man alone just grumbles, screams and pass on his life with agony. Why this great difference? Is it the wish of the God Creator, the Nature or whatsoever the name mankind has kept for the supreme power which controls everything? No, Certainly not. All because of the man only.

When we just listen, one fact can be seen that except man, in other species i.e., the birds and animals, all are left to the course of life with their own self. Not even a least interference in the affairs of others. Yes. The world would have been a paradisiacal one for human beings also when human beings are allowed to live with their own self. A question may arise that is it not necessary to care, guide the child? No. Not at all it seems to be. If at all any guide, care, help is required the interference at the least in the affairs of the child or anyone whenever one is required will do to be beautiful.

Normally one wish to learn anything from a Guru or a Teacher or a Master for the things only which are not known to him. Not for the things known to him. Let us just listen to the course of movements happens in the childhood from the birth to till it walks on two legs. Yes. You may be surprised to see that the asanas (exercises) which mankind finds difficult to perform is happening in the child hood effortlessly for which in the adolescent age one goes to a teacher to learn yogasanas.

1. The child some days after the birth used to lie facing the sky and kicks the legs front and back. This posture is called as cycling in Yogasanas.
2. End of the third month the child turns and used to lie with abdomen on the earth. Sometime after, keeping the palms firmly on the earth. Sometime after, keeping the palms firmly on the ground used to lift the hip and head as an arch which fits with *Bhujangasana* which is good for respiratory system.
3. The child lifts the two legs up and we call this as *Salasana*.
4. Sometimes after this, the child walks on the knees and two hands. This posture is called as *Simhasana*.

5. The child used to relax while making moves (*Simhasana*), with the buttocks seated over the legs and with the spinal chord straight. This posture is called as *Vajrasana* which keeps the body strong.

6. When the child happened to see more members, it turns bends and used to see through two legs and laugh. This posture is called as *Padhahastasana*.

7. The posture *Savasana* which is so beneficial out of all asanas which many finds difficult happens so effortlessly when the child is relaxing.

If you just listen sincerely you can see, the asanas *Patchimothasana*, *Dhanurasana*, *Ardha Sirsasana* etc and some postures which even a great Yogasana Teacher may find difficult to perform, is just happening with the child. Yes. Not even the child do perform. It happens in the childhood stage effortlessly, the stage no one has missed with. Yes. It is neither the wish nor the plan of the God or so to keep the mankind to pass his life with agony. It is we who are responsible for the miseries exists in the mankind especially with the civilised section.

It is crucial time that the mankind is passing through. Yes. To allow the mankind to exist in the universe or to extinct from the universe is left with the mankind. Because of the childhood is subjected to prone to others let the elders do not misguide which not only makes the child's future as dark but also it makes a sane to an insane one. Yes. Man alone is born as sane and ends his life as insane. To let it not happen again let our endeavour do not interfere in the affairs of the others. If at all anything is required let it be at the least. Because to be wise, for the International slogan for the year 1978, Human Rights *Man is Born Free; None shall enslave them*. Yes let us do not become a victim for enslaving others. If at all it is inevitable atleast let we do not become a victim for enslaving our own child.

God, gave his creatures Light, Air and Water open to the skies; Man locks him in a stifling lair and wonders why his brother dies?

-Oliver Wendel holmes

Why go globe-trotting for a healthful climate? Why not make your home a healthful place in which to live

-Somebody

Hlt-41 **Standardisation of Diagnostic Method of Urine Analysis in Neerizhivu Noi - According to Siddha Medicine**

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The Traditional Siddha Medicine is not only based on the three humours for Diagnosis but also the clinical criteria. Simpler Diagnosis methods like Neerkuri, Neikkuri, that is analysed of Urine macroscopically and using Gingley oil are mentioned in Therayar Neerkuri, Neikkuri 50 patients with Neerizhivu Noi confirmed by blood sugar levels were chosen

for the study and Urine analysis was done on Therayar Neerkuri, Neikkuri criteria. The results were compared with Urine sugar levels and presented. This readily available, economically feasible, and technically viable diagnostic method confirms that traditional wisdom of our Ancient Siddhars.

Hlt-42 **Relevance of Traditional Values of Community Attaining Health for All upto 2000 A.D.**

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Health of the people is not only a desirable goal but is also an essential investment in human resources. The National Health Policy (1983) reiterated India's commitment to attain *Health for all (HFA) by 2000 A.D.* Primary Health Care has been accepted as the main instrument for achieving this goal. Accordingly a vast net work of institutions as primary, secondary and tertiary level have been established. Control of communicable diseases through national programmes and development of trained health manpower have received special attention.

The National Health Policy assigned an important role to ISM & H, (Indian systems of medicine and Homeopathy) in the delivery of health services. There are about 5.25 lakhs institutionally trained practitioners of ISM & H. These practitioners are close to the community not only in geographical proximity but also in terms of cultural and social ethos and as much they can play significant role in primary health care delivery.

These two para's are from the eight five year plan document of Government of India. It is clear indication from the above how the health for all by 2000 A.D. is the goal and for achieving it the ISM & H has considered the culture and social ethos of the community, can play a significant role in primary health care delivery. Culture includes value system, traditional values, social ethos and so many other things of the society/community.

UNESCO defines culture as including the whole complex of distinctive, spiritual, material, intellectual and emotional features that characterize a society or social group. It includes not only arts and letters, but also modes of life the fundamental rights of the human being, value systems traditions and belief.

How the value system, traditions and belief are playing a significant role in maintaining health of a person, it is worthwhile to mention here that on 27th and 28th Jan. 1995 the International conference on life style and health was held in All India Institute of Medical Sciences, New Delhi. It is the general feeling of the scientists that the high technology medicine can not change the health status of the people or not the remedy of the Health of the nation. It needs people rigorous involvement at the community level. The medicine is the only political affairs of the state as well as the propaganda of the developed countries to mould the developing countries in their own interest. It can be quoted in the words of the German physician scientist statesman and father of social medicine, Rudolf Virchow.

Epidemics are like the large signpost from which a statesmen of stature can read that a disturbance has occurred in the development of his nation, which not even careless politics can afford to over look In the 150 years since Virchow pointed out that medicine was politics, development in the science have been such that there is a medical therapy for most human ills, the root is in the political roots of society. In this context the slogan of globalization, free trade foreign money investment, patent laws and the latest relation establish by the UNDP, that HDI is quite related to AIDS in Asia and India is the bank of AIDS for Asia. *India will soon be the HIV capital of Asia* statement given by UNDP Regional HIV project Chief Peter Godwin (TOI 16.9.95). *AIDS leading threat to public health* (Hindu 15.9.95).

It is worthwhile to mention here that the ancient Ayurvedic medicine had the proper and wider out look on problems of health. Indian medicine as a science looked to health as the

chief basis for development of the social, ethical, economic, artistic and spiritual basis of man. Charak, the famous compiler of Chrak Samhita has rightly said.

Dharmarth Kamma Mokshanam Arogyam Mulam Uttamam

He further stresses that the ideal of a person practising medicine is not merely earthy gains and worldly pleasures but the relief of human sufferings.

Natmarthan Napikamartham Ath Bhootdayamprati

The aim of practice of medicine according to Indian ancient medical science is to preserve positive health in the healthy and relieve the suffering of those who are afflicted with diseases.

Swasthanam, Swasthyarkshanam and Vyadhitnam Parimokshanamcha.

Hlt-43

Ayurveda Shareera - Physiology

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Ayurveda an ancient Indian system of medicine advocated by Rushees of Yore though age old but superior in explaining the physiology in the lines of Dosha-Dhatu Mala which adds much to the modern world of physiology.

Dosha Dhatu mala moolamhi Shareeram

Doshas understanding and adopting the principles useful to keep the body in fit condition by samana guna, Ahara, Vihara, activities to prevent any pathology in the body.

In Tridoshas **Vata** a functional unit of the body explains macroscopic to electronmicroscopic levels including the Manas a step always ahead of modern understanding of nervous system.

Pittam a metabolic unit of the body under the guidance of Vata discarding the enzymes and hormones to digestive tract even upto tissue and cellular level metabolism.

Kapha a cohesive factor and immunomechanism of the body providing the body under the guidance of Vata again.

Dhattus Dattay Vyakastaka dharmam iti Dhatu which are again attributed to the Doshas in particular to Vata explainable through Ashraya Ashreayee bhavam. Explanation of Saptadhatu is an another contribution to modern limitage of four tissues.

Ojas: Ayurvedokta Ojas is an outstanding contribution to the modern medical world which they are yet to know & which speaks much about the body immunosystem and lack of which the dreaded diseases like AIDS etc occur.

Malas Mala Mootra Shakrun Swadadayapichan not only explain the excretory system but also give the education about their essentialities in the body and also reflect electrolyte balance position of the body under the influence of again Vata which is Swayambhoo - Self existing.

Hlt-44

The Necessity of Technological Stand in Ayurvedic Industry, with Reference to Bhasmi Karana

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Ayurvedic Industry is referred here as business oriented Ayurvedic manufacturing service centre. The Technological stand here refers to the basic manufacturing Technicality, without disturbing the Ayurvedic & Rasa shastric principles.

For ex: Shuddhi of metals, minerals, poisons, Gumresins etc. in which by the process, there will be lot of change in the material, pharmacologically, physically, & Chemically, which requires the fundamental research.

These processes are recorded in ancient treatises and diversified in to Rasa sampradaya & Siddha sampradaya.

One among these techniques is *Bhasmikaarana*, which needs the technical supervision, who has learnt the subject, theoretically & practically, which seems to be talking in Ayurvedic industry.

In the present paper, we present in detail the technique of *Bhasmikaarana* Process and its nationality basing an Indian Metaphysics.

Role of Tribal Community in Developing Traditional Health Practices

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Location

While working in hilly, high rainfall natural forest, area of Western ghat that is *Bhimashankar* a holy place & a tribal area in Pune District of Maharashtra on programme of Development of Local Health Tradition, run by Maharashtra Arogya Mandal, Hadapsar, Pune 28. I learnt about a very deep relationship of tribals with their environment.

The Objectives

- *Collection & documentation of Traditional health practices of Mahadeo-Koli
- *Survey of Local Flora, Fauna & minerals that is being used by people in their traditional practices.
- *Status of Traditional health practices.
- *Role of traditional health practitioners in village health system.
- *Analytical study of local Flora.
- *Role of community in developing traditional health practices.

*Tradition health practices of tribals & its relationship with Ayurveda.

Discussion

For about thousand years tribals here have developed their traditional health practices by tribal & error method. These practices are found to be very much useful in primary health care. These traditions are time tested & these people have faith in them. This traditional knowledge is their strength by which they are still alive in such difficult climatic conditions.

Tribal communities still away from modern development. They still depend on forest for their life needs. They have deep & detail knowledge of bio-diversity.

Their simple life style & harmonious relationship with forest is important in conserving bio-diversity and this traditional knowledge.

These tribal communities play major role in development of local health Traditions.

Sidha Maruthuvathil Rasavadam Or AIVU Chemistry in Sidha-Research

Selva Shanmugam

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What is Rasavadha, who started it? Why? When was it first started? All these questions are analysed in this paper.

Included as paper no. 15 in the Tamil section

Revival of the Herbal Tradition to Promote Community Health Care

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As modern health care services are getting commercialized and exploitation in nature, it is necessary to empower the poor people with the knowledge and skill to manage their health problems by themselves.

Revitalization of simple herbal and home-remedies will be a big step in this line.

With the following 120 easily available medicinal plants, we can manage most of our ailments.

1. Ornamental plants like Aloe vera, Satavar, Harjoda, which can be grown in flower-pots (about 20 plants) along with a few kitchen item like jeera, methi (fenugreek) will be sufficient to manage the common ailments.

2. Medicinal plants that are either ornamental or of food value like pomegranate, mango, Aparajit (*Clitoria ternate*) Parigata (*nictanthes arbor-tristis*) (about 40 plants) can be grown in the back-yard.
3. Big trees and creepers like pipal tree, banyan tree, fig tree, (about 35 plants) can be planted in common places like the premises of temples, churches and mosques and road

sides.

4. There are many varieties of grass which are highly medicinal, but are seasonal. These herbs can be dried and preserved for the whole year.
5. With the knowledge of using any 40 medicinal plants from the above list you can manage most of the ailments.

Hlt-48 Management of Benign Prostate Hyperplasia (BPH) with an Ayurvedic Approach

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Benign Prostate Hyperplasia and its management remains a milestone for the physicians, surgeons and biomedical scientists all over the world. Many hypothesis has been put forward in reference to the origin, development, etiopathogenesis of disease and its modalities of management. However in Ayurvedic literature, many types of urinary disorders has been described. Amongst them Vatasthela and Mutragranthi are very nearer to BPH, according to its symptomatology.

Patients with larger volumes of BPH have higher free serum testosterone and destrogen level suggests that the increased availability of free testosterone associated with increased stimulation from plasma oestrogen may be involved progression of BPH in man.

BPH is the disease of old age group and according to Ayurveda it is the time of Vitiation of Vata. Therefore keeping the above factors in mind use of Vastikarma therapy with encouraging results after 21 day of therapy.

I have been taken 100 cases of BPH in the hospital of Institute of Medical Sciences (IMS) and treated that patients with the help of Vasti therapy. In our study the results are encouraging particularly reduction in free serum testosterone, weight of prostate and also decrease the residual urine. The details will be described at the time paper presentation.

Hlt-49 Yoga, the Holistic Health Capsule for the Body, Mind and Soul

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What Yoga is not.

What Yoga is.

Why Yoga should not be treated as religion.

Indian philosophical tradition and Yoga, its historical evolution up to the modern age.

Six Systems of Indian philosophy

- a. Nyaya of Gautama
- b. Vaiseshika of Kanaada
- c. Sankhya of Kapila
- d. Poorva Mimamsa of Jaimini
- e. Yoga of Patanjali
- f. Uttar Mimamsa or Vedanta of Badaarayana

Exposition of Yoga philosophy in our scriptures classified as under

- a. Shrutis - 4 Vedas which are of highest divine authority, (2000 to 1000 B.C.)

- b. Smritis - Traditional scriptures like Manusmriti (Code of Manu)
- c. Itihas - Epics like Mahabharata and Ramayana
- d. Puranas - Mythological stories like Vishnupurana
- e. Agmas
- f. Darshanas - Yoga Darshana

Classification of Yoga in Yogatattva Upanished as

1. Mantra Yoga
2. Laya Yoga
3. Hatha Yoga
4. Raja Yoga

No detailed exposition aimed during the Congress

Maharishi Patanjali's Yoga Sutras describing various aspects of Ashtangayoga as propounded by him:

1. Yama
2. Niyama

vi] Kapalbhāti

How Yoga is known as a holistic science.

Classification of disease from the standpoint of Yoga.

Recognition of therapeutic characteristics of Yoga by prominent allopaths, scientists.

A hint for the Yoga teacher.

Hurdles in the Spread of Yoga

a) Biased mass-media

b) Permissiveness of Society

c) Increasing materialism

d) Amoral Yogins of today

e) Competitive Yoga

f) Unscientific methods used by teachers

The dawn of new era of science

An action plan for rapid expansion of Yoga in India and abroad-health for all by 2000.

Yoga to the rescue of the man in 21st century.

Establishment of a National Yoga Consortium, NYC should have centralised budgeting/allotment of funds/monitoring mechanism/internal auditing/rigorous annual review of targets achieved or programmes failed, with following wings:

a) Applied Research

b) Transfer of technology

c] Yoga Therapy

d) Administration & publicity

3. Asana
4. Pranayama
5. Pratyahara
6. Dharna
7. Dhyana
8. Samadhi

Only outline definitions of these terms, no details to be discussed at the Congress

Yoga as described in Bhagavad Gita

- Karma Yoga (Yoga of action)
- Bhakti Yoga (Yoga of devotion)
- Jnana Yoga (Yoga of knowledge)

Metamorphosis of matter from gross to subtle through the practice of Yoga.

Specific therapeutic aspects of Yoga-the three basic principles:

- a. Conferring absolute health to one part or system of the body and thereby influencing the rest of the body.
- b. Balancing the Positive and Negative energy poles (Ida/Pingala, Prana/Apana)
- c. Purifying the body of the three types of Doshas (Wastes)-
Cough, Vata and Pitta with the help of Shat-kriyas:
 - i] Dhauti
 - ii] Basti
 - iii] Neti
 - iv] Nauli
 - v] Trataka

Hlt-50 Oiletion Therapy and Topical Application

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The traditional practice most maligned by modern physicians is the Oiletion therapy. According to them the anatomy of skin specifically the epidermis does not allow anything to penetrate through it and Oiletion therapy is of no value. But in practice topical applications of medicated oils both for scalp

and the body surface is widely used by traditional physicians. The efficacy of the Oiletion therapy is based on modern dermatological knowledge and traditional wisdom are discussed and detailed in the paper.

Hlt-51 Ayurveda - Medical Aspects

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Ayurveda is a science of life. It deals and discusses various aspects of life. Since the life on earth, the quest for the healing of disease started. The cumulative accumulation of that work since centuries came in the form of Ayurveda, which is

compositum of culture and heritage of Natives. Ayurveda based on experiences as if experimented. After full development of Ayurveda, it has been branched into 8 wings which are called as Astanga Ayurveda, namely Kayachikitsa (Medicine)

Salya (Surgical) Salakya (ENT) Bala(Paediatric) Jara(Genetics), Rasayana, Vajikarama(Rejuvenation and Aphrodisiacs), Graha(Planetary effects), Visha Chikitsa(Toxicology).

Out of all these, kayachikitsa, comprised of 70% Ayurveda, remaining all the branches of the system are also actually rooted from Kayachikitsa. Kayachikitsa can be said as Int Medicine or general Medicine, which comprises of treatment of Sareera Agni i.e. digestion and Metabolism.

Ayurvedic Science deals with its pre-emblem of *Swasthasya Swasthya Rakshanam, Aturasya Roganuth*. Regarding Swasthya Rakshanam (Maintenance of health and prevention of disease), Ayurvedic Science dealt more elaborately. It advocated from *brahma Muhurte Uthista* to retiring on bed, as Dinacharya, Ritucharya is to maintain health according to seasonal climatic variations. Apart from it *Swasthasyorkasharam* dealt in detail with Rasayana Vajikarana. This concept of Dinacharya, Ritucharya Rasayana Vajikarana are sole contribution of Ayurveda to Medical science.

The second aspect of Ayurveda is *Aturasya Roganuth* which deals with the cure of disease (Medical); Before discussing the Medical Superiority of Ayurvedic science let us discuss briefly regarding physiology in the science.

The concept of Dasha Dhatu Mala theory is the basical philosophy of Ayurveda, which deals about Tridoshas (Vata, pitta, kapha), Sapta dhatus (Rasa Rakta, Mansa, Medo, Asthi, Majja Sukra) Trimalas (Purusha, Mootra, Sweda). The imbalance of these three and aprasanna atmendriyamanas are results in disease. Similarly, functional aspects of life is Agni, which is the factor for all transformation i.e Metabolic activities, food to tissue, food to energy, in the body. Bringing all these factors into balance is called *Aturasyaroganuth* and maintenance of the balance is called *Swasthya rakshana*.

The diagnostic methods of Ayurveda are far more better. Ours is based on *Trividha Pariksha* which is purely linked with intellectuality of the physician, it is completely depends on the Monah Budhi Indriyas of Physician, not necessarily depend on others like laboratory and other investigations. Measuring the disease and health in parameters is not always correct, where the Budhi of the Bhishak is superior.

Ayurveda feels and advocates the treatment for entire body as a single unit. It never thinks in the terms of individual organs. It thinks that body is compositum of all organs. Hence it is possible to give comprehensive treatment. The principles of treatment in Ayurveda consists of Shodhana (elimination of morbid factors) and Shamana (Palliative treatment) karmas. Shodhana Karma is also widely called as Panchakarmas, i.e. Vamana, Vierchana, Vasti, Nasya, Raktamokshama are important procedures to eliminate the morbid factor such as Vikriladoshas, Dustadhatu, Malas, and to maintain the homeostasis in the body, an approach of this nature is unparallel in annuals of Medical science.

Stability of the chemical composition and Physico-chemical properties of the internal environment is a most important feature of the organism of higher animals, this state is called Homeostasis. Homeostasis is expressed by a number of biological constituents i.e stable quantitative indices characteristics of the normal state of the organism. They include the values of body temperature, the osmotic pressure of blood and tissue fluids, their content of Sodium, Potassium, Calcium, Chlorine and Phosphorous ion and of protein and sugar, the concentration of hydrogen ion, and a number of other indices. The various organs and systems of the body chiefly digestive system, circulatory system, Respiratory system, have different roles in maintaining Homeostasis. Even slight disturbance of Homeostasis give rise to a pathological condition.

In eliminating the toxic, putrative substances from G&T, to eliminate the end products of the decomposition of organic substances (dusta dhatus & Mala) and to maintain a constant level of doshas in the body. Shodhana Karmas plays a vital role. Thus the principal of Shodhana Karma plays a vital role in maintaining internal environment, buffer system (blood and tissue fluids) and in Homeostasis of the body. Hence the contribution of Shodhana therapy shows the par excellence of Ayurvedic ideology.

Shamana therapy is intended for correction of imbalances of Tridoshas and maintenance of balance of tridoshas, nourishment of Dhatus and to deal with Vridhi kshaya of Dhatus and Malas. Shamana therapy is administered internally and externally. In this treatment Ayurveda feels that "*there is no drug on earth which not acts as Medicine*", so, intelligence is only the key in application of things.

For formulations and assessment of action of the drugs, the theory of Rasagunaveerya vipaka established, which is more convenient for a physician to formulate the medicine according to need and not necessarily depend on pharmaceutical preparations. The formulations are made in the form of panchavidha kashaya kalpana to suit the palability of the patient and to elicit the required potency of the drug; and the system is also advocated Anupanas in administration of drugs to have synergistic action and to act as vehicle for the drug to reach the target organ.

For example, in all vatarogas (mostly neurological disorder) Sneha dravyas are Thaila/Ghrita formulations are advised to contain such disorders. Lipid soluble drugs rapidly absorbed and quickly reaches the site of action which is mostly required in neurological disorders, apart from it, the lipids (Shena dravyas) readily crosses the blood brain barrier, so that action of the drug will reach the cerebrum and Spinal chord, and even they crosses the placenta and breast epithelium. So the superiority in formulation and administration of the drug exhibited in Ayurvedic system. Hence, we are able to treat the disease of more complicated cases of nervous and Hepatic disorders.

The theory of Raktadusti in causing many skin disorders is most convincing and by correction of such dusti, we are able

to control many uncontrollable and chronic skin disorders.

There are innumerable theories and principles of Ayurveda regarding Samprapti (pathology) Chikitsa (treatment) including formulations to get relieve from many chronic and incurable disorders, which are par excellent.

In Psyschiatry, Ayurveda advocated many principles to prevent and cure the Manasika vikaras than any other system. To keep the Rajah tama dosas in balance many advises have been given. Mainly in prevention of the Manasika vikaras advised the individuals to follow to Achara Rasayana and bear with Dharaniya vegas for equilibrium of the mind of the individual and also to achieve a better society.

The Principles, the treatment and philosophy of Ayurveda is one of the best system which fulfills the essentialities of human beings. Ayurveda has got many marvellous prescriptions without any side effects on judicious use. Still there is much to put in practice of Ayurveda. In view of the advanced technology there is much to re-discover and application of technology in perusing the principles of Dosha Dhatu Mala theory, for a better diagnosis and treatment and identification of Rasa Gunaveerya vipakas of an unknown drug for assessment of action of a given drug and its therapeutics.

Thus Ayurveda formulates the holistic approach of treatment by subjecting the body as a whole giving least importance to rogabalam. May be for this reason treatment in Ayurveda is time consuming but results are long lasting.

Hlt-52 Ayurveda - Medical Classification Par Excellence

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Classification is the criteria for any class of science. The way Ayurveda classified its contents is classified par excellence. It appears that the accidental medical science derived its inspiration for classification from Ayurveda only in view of the anthropological approach.

Dealing at length the subject of Kaya Chikista, now known as General Medicine is an eye opener as to the quantum of the subject of statistical importance. Charaka, referring cases other than Medical to surgical etc. to susrutha school suggests the importance of specialisation and referral services.

Naming the earlier compedia of Ayurveda as Samhita suggests the sanctity of multiauthors text books, so well currently proved as beneficial.

Starting the volume on treatment in Charaka Samhitha with Rasayan (maintenance of Nutrition) is itself of prime important

approach suggesting the role of Nutrition in the health and disease.

Considering the primary importances of sex in life geriatrics has been incorporated in the early chapters of treatise on treatment.

At many places, applied anatomy and physiology is incorporated in the volume on treatment at the beginning of the chapters like Nervous Disorders (Vata Roga), digestive disorder (grahani) as is found replicated in Medical Texts.

Dealing of the basic subjects on Pharmacology, Preventive Medicine, Anatomy & Physiology etc. under sootrasthana is to be highly glorified.

Dealing Eye, ENT, Paediatrics and Gynecology in a separate volume (Uttara tantra) is the height of specialities. More compatible is dealing of Embryology and Obstetrics in the volume of Shareera.

Hlt-53 Collosal Concept of Eugenics and Concrete Contribution by Ayurveda

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Eugenics a science to improve the human culture, has been an aim of the Modern Medical Science but with little consequence, that uthopian ideal could not be conquered so far. In such a critical context comes Ayurveda with a fund of knowledge and know how more like a genetic engineering, the enlightened study of modern modus operendi.

The genes, which are the primary principles of birth and birth characters are traced back to the food, the odanam. The type of the latter forms the basis of the genes on a chemical nature known in Vedas as Pachamahabhutas.

From this point of view, certain rules regarding food activities and behaviour are broadly suggested to the lady during menses to have a child of choice, rather than by chance (Rithmati Paricharya) and Rasayana and Vagikarana to the male.

This is followed by annonting of Ghee to the body by male and gingeli oil to the lady daily till the date of sexual intercourse preferably from 12th to 14th. The couple is advised to abstain from sexual indulgence before and after this period.

During the pregnancy the lady should not wake up late in nights and should not be allowed to live lonely etc. to avoid untoward effects on the foetus.

During 3rd to 4th month of pregnancy her requirements and yearnings should be suitably met in order to maintain the mental ability tranquility of the child. Antenatal care and postnatal care as adopted are of high academic order.

In order to stimulate the several neurological function of the child sound is produced with two stones near the ears of the new born child. Ghee and Honey in equal quantities is given to the child to swallow followed by vacha/gold bhasma in ghee and honey to develop immunity and mental capacity and ability.

For the marriage it was made mandatory that the girl should be above 16 years and the boy above 25 years of age and that too extrasanguinous marriages (Atulya Gothra).

Hlt-54

Embryology - Ayurvedic Aspect

Shubhada Velanker

Pune

- 1) According to Ayurved, formation and growth depends upon these factors
 - i) The sperm ii) The Drum iii) Physical and Psychological health of the parents iv) Regular menstrual cycle of the mother v) Proper functioning of the internal bodily doshas.
- 2) Garbhavakranti includes the process of descent of the soul into the womb, its growth in the uterus and the subsequent birth of a child.
- 3) This whole universe is made up of five elements pancha mahabhutas and the human body is also made of these atoms and development of the foetus depends upon them.
- 4) In a sound mental and physical condition fertilisation will take place.
- 5) Atma participates in the formation of the embryo. It is encircled by the deeds of the past birth.
- 6) In the seventh month all the feature get proper nourishment. All the major and minor organs are fully developed and the whole body gets completely associated with Dushas Vata Pitta and Cough.
- 7) Ayurvedic texts describe all these points discussed so far in short but all the minute details are covered by them.

Hlt-55 Chromatographic Method for the Detection of Ginger (*Zingiber officinale*) in Ayurvedic Preparations

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Ayurveda is an ancient system of medicine of rich heritage.

In olden days Physicians themselves involved right from the procurement of the drug to the administration of medicine to their own patients. Thus there is no chance of adulteration or use of substandard or spurious drugs. Now the state of affairs have changed. The prescribing physician and the patient has to depend on market samples. Adulteration has crept in as in other walk of life. The use of the adulterated or spurious medicine may sometimes do more harm than any good to the patient. This necessitates the need of standardisation in Ayurvedic medicine and introduction of quality control measures. Standardisation of Ayurvedic medicine comprises of the standardisation of single drugs, finished products and method of manufacture.

Standardisation of Ayurvedic medicines will certainly help to revive the parts glory of our ancient system and will provide necessary tools to an enforcement agency to check the quality of medicine.

Standardisation of Ayurvedic medicines poses many problems compared to that of allopathic medicines. Because allopathic medicines contain limited number of ingredients of known structure and purity. At the same time an Ayurvedic preparation contains more than one plant drug and each plant drug contains a number of different constituents like steroids, phenols, alkaloids, flavanoids, etc. of known & unknown structure. Again during the preparation (boiling for a long time with so many other things) nobody can predict the changes that may happen to them. Another thing is that methods are not available for the detection and estimation of ingredients as in the case of allopathic medicines. However, methods are to be evolved for the standardisation of Ayurvedic medicine to keep up the therapeutic efficacy of it.

This paper deals with the chromatographic method for the detection of *Zingiber officinale* in Ayurvedic preparations. Ginger is one of the most commonly used ingredient in Ayurvedic preparations. Though detailed study of ginger has been

done, so far no method has been evolved for its detection in finished products. Thin layer chromatographic method was used for the detection of ginger in the preparations. Samples were selected from the different item, like Ghritam Choornam, Thailam, Kashayam, Lehyam, Kuzhambu, etc. Different solvent systems were tried, the one which gave best resolution was selected. In the case of Choornam, Kuzhambu and Le-

hyam, sample was refluxed with alcohol for 30 minutes and alcohol extract was used for the study. In the case of Thailam and Ghritam the unsaponifiables were taken for the study. The alcohol extract of the ginger was spotted with the extracts of the finished products. Cyclobexane: Ethyl Acetate 7:3 and Pet ether: acetone 8:2 are the two solvent system evolved for the detection.

Hlt-56 Approach of Ayurvedic Venupuncture Technique (Siravedha) to the Management of Snake Bite

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Snake bite is a very common problem encountered by the people specially in the village and forest area. Snakes vary on the level of their poisonous efficacy and when a poisonous snake bites to some one, it creates almost a threat to the life of the sufferer and needs the immediate attention of the doctor.

There are various methods of treatment e.g. First aid, Herbal treatment, use of anti-venum, popularly known to the people. Among less popular treatments there is a popularly known Ayurvedic venupuncture technique named as *Sira Vedha* (*rakta Moksana*), which has been a choice of treatment during ancient period in India. Acharya *Sushruta* considered and

applied the *Sri Vedha* for snake bites as best treatment. References available in *Samhita* speak in detail on the methods and merits of this system.

Author while visiting to some village and staying there was circumstanced to manage to snake bite case and he managed the case with the *Rakta Moksana* (*blood Letting*) technique. This is embodied with his experience. The science and the technique of the Ayurvedic Venupuncture in cases of snake bite and the details of the value added experience on the management of snake bite will be presented in the full paper.

Hlt-57 Recent Development in Traditional Medicinal System of India

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India has several unique features in the medicinal and aromatic plants sector, the first and most important being a wider use of native plants in the Indian system of indigenous medicines which still caters to a large section of people. The traditional system uses about 1100-1500 species in different systems. Most plants in traditional uses as drugs or cosmetic raw material are regularly collected from the forest. Due to the growing demand of these plants, a large number of pharmaceutical industries have come out and now many plants are under cultivation in the farm sector. Intensive crop improvement programmes have been initiated at state and All India level. Under AICRP on M & AP under the aegis of ICAR many high

yielding varieties have been developed e.g. GS-1 and GS-2 in Isabgol, JA-16, NOP-4, IC-42, NBRI-3 in Opium; RS-1 in Ruavolfia, IC66 in Hanbane, EC-41911 in Japanese mint, HY-8 in Vetiver, IC-31245 in Palmarosa, OD-19 in Lemongrass etc, Current export of raw material, essential oils, phytochemicals, and aromachemicals amount to about Rs.2000 million annually. The world market is growing faster than supply and India has made a lead in export for mint oil, menthol, lemongrass oil, citral, celery and oil of jasmine. In recent years spice oils and oleoresins of Indian origin have also made a promising entry into the world market. page 58

Hlt-58 Health for all by 2000 AD : Role of Siddha Physician Community

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The siddha system of medicine is the system bestowed by the Tamil culture to the world. This system was pioneered and

developed by Tamil Sages from time immemorial. This paper outlines a brief history of Siddha medicine system, its incred-

ible achievements in the past, its philosophics, the reasons for its progressive decline, the pathetic state in which it finds itself now, and an outline for future hopes.

The Alma-Ata declaration, which has been accepted by the World Health Organization, aims at *Health for all by 2000 AD*. With every other medical system, Siddha can play a major roll in achieving not only in Tamil Nadu but also nationwide and worldwide. This paper describes an action plan for this.

Hlt-59 **Agnihotra for equilibrium of nature and enhancement of human life**

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Agnihotra is a scientific process of purification of the atmosphere with the agency of cosmic element-FIRE

The research studies in India and abroad indicate the efficacy of Agnihotra in many areas; definite improvement in physiological and psychological well-being of individuals and family members, enhanced agricultural output etc.

This paper briefly explains the Science of Agnihotra and the need to accelerate its practice for the benefit of our Society at large.

Definition of Health and Disease

Health is normal and harmonious vibration of the elements and forces composing the human entity on the physical, mental and moral planes of being, in conformity with the constructive principle in nature applied to individual life.

Disease is abnormal or inharmonious vibration of the elements and forces composing the human entity on one or more planes of being, in conformity with the destructive principle in nature applied to individual life.

Agnihotra is a gift to humanity. It gives everything that life needs.
Heal the Atmosphere, Perform Agnihotra,
Do it, do it now for *Sukha*.

Pollution Everywhere

Presently, the biggest threat to mankind is pollution-in atmosphere, water, mind and thought, drug, alcohol etc.. There is no concise way of removing these pollutants, at best we can only reduce their bad effect on us.

Sukha

The word sukha is most of our Indian languages means good atmosphere. In Sanskrit Su means Good and Kha means Atmosphere. We all seek sukha, hence we should know how to get sukha, the good atmosphere. We can create sukha through fire i.e. Agnihotra-By five simple basic fundamental principles.

veda originate from the root vid means to know reason and logic giving everybody his right to know. Knowledge has to spread

Conclusion

The discussions in the paper are convincing enough to show that regular performance of Agnihotra brings about wholistic development of human being. It is least time consuming - around 10 minutes twice a day at Sunrise and Sunset.

Hlt-60 **Traditional Treatments for Skin Disease among the Tribal and Rural Communities of Rajasthan**

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Ethnobotanical surveys were carried out by the author since last two years in the tribal rich pockets of Rajasthan. The districts of high tribal concentration are Alwar, Banswara, Dungarpur, Sawai Madhopur, Chittorgarh, Sirohi, Udaipur and Baran. Besides this certain rural communities also were covered. The major tribals surveyed are the Bhils, Meenas, Garasias, Damors, Kathodias and Sahariyas. Some of the rural communities covered are the Gujars, Jogis, Raibaris and

Vishoois.

Ethonomedicine formed an important line of enquiry among the ethnobotanical investigations. Data was collected first hand from the local people. Detailed interviews were taken as to the medicinal uses of plants. It was found that skin diseases are rampant in the tribal and rural areas, and over other diseases

They are more common. A wide array of treatments to treat the skin diseases also exists. The skin ailments and their treatments described in the present communication are abscess/boils/pimples/bubo, burns, cracks in skin, carbuncles, leprosy, leucoderma, lice/drandruff, ringworms, scabies, small pox, sores and blisters and wounds. Of these boils and pimples, scabies

and ringworms are most common. Most of the treatment described, have been done so perhaps for the first time. A total of 23 species belonging to 22 families have been described. The paper gives a detailed account of plants used in skin diseases along with part used, preparation to drug, mode of administration, doses and tenure of treatment.

Hlt-61

Herbal drugs used in Veterinary Medicine by Tribal & Rural People of Rajasthan

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Bhils, Garasias, Damors, Kathodias and Seharias are the major tribes of Rajasthan a sizable section of whom can be seen living in primitive conditions. Demographically the Meenas are the largest tribe but mostly acculturized. Besides there are rural communities who follow their traditions even today. Some examples are Vishnoi, Gurjar, Raibari, Jogi etc. Though these communities are coming in grip of acculturization and urbanisation they have even today retained their traditions.

Keeping livestock as a major occupation for a large population of tribals and rural communities. The major animals kept by the people are cows, buffaloes, bullocks, goats and camels. In some cases compared to agricultural land holdings the cattle possessions are proportionately much larger. Though government dispensaries are there in most areas, for most of the diseases and ailments of the cattle and other animals, the people tend to the ailments of their animals themselves through tradi-

tional knowledge of the medicine properties of the floral resources around them.

Ethnobotanical surveys have been carried out by the author since the last two years and observations were taken on the veterinary medicine in vogue in the tribal and rural societies. The diseases dealt in the present communication are prolapsus ani, bone fracture, stomachache, retention of placenta after delivery, distension of abdomen, constipation, diarrhoea, indigestion, scabies, abstaining from fodder, ulcers, cataract, internal heat, infestation of thorns, parasites and poisoning. Scabies, prolapsus ani and retention of placenta after delivery are the most widespread ailments.

Twenty plant species of angiosperms belonging to sixteen families are dealt with in the present communication.

Hlt-62

A Special Technique of Shodhana (purification) used in Indian Pharmaceutics

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In Indian Medicine Mercury, Sulphur, Metals, Minerals, precious and semiprecious stones are extensively used in hundreds of formulation after it is being purified and incinerated properly in to Bhasma form. Conversion of these metals and minerals in to pharmaceutically suitable form could be made possible only after the development of *Rasa Shastra* - an independent branch of Indian Pharmaceutical Science, in about 8th/9th Century A.D. and onwards. The processing of Shodhana, Jarana, Marana etc. were developed to convert these in to least toxic or non toxic, highly absorbable and therapeutically effective compounds

with a view to make their frequent use possible in therapeutics.

Our aim is to view Ayurveda by scientific approach so as to explain it in to its various steps with out hampering the principles of Ayurveda. Shodhana is one of the most important techniques of Indian Pharmaceutical Science, for which many heating, disintegrating, grinding and potentiating techniques have been developed.

Present paper deals with the critical analysis of this Shodhana technique.

Hlt-63

Folklore Remedies for Common Diseases with Special Reference to its Pharmaceutical Preparation

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Folklore is the traditional lore which has survived in a certain locality, among certain people. It is related with the customs, belief and traditions of the folk. Ayurveda has also advocated

the drugs which grow in a particular area prove more beneficial for the people of that very region.

The plant kingdom is the main worthwhile wealth of nature, and the use of these plants in India to relieve mankind from their sufferings were known from the ancient days. I have also found Tulsi, (Juice), Neem, (Juice, Paste), Durva, (Juice), Ad-

raka(Juice), Gudhal(Paste), gairda(Juice), Dron-pushpi(Juice), Parijata(Juice & Paste), etc. plants more beneficial in curing various diseases like fever, skin diseases, opistaxis etc.

Hlt-64 The Mode of Transmission of Traditional Knowledge in Folk Medicine

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This paper tries to examine the modes of transmission of traditional knowledge in folk medicinal practices. What is generally known as traditional practice of folk medicine contains in itself elements of *Nature* and 'culture'. Sanctity and secrecy are the two most important principles of folk medicinal practice. It was firmly believed in folk medical discourse that the effectiveness of medicine depends entirely on sanctity and secrecy. It was believed therefore that the transmission of this traditional knowledge has to be carried out cautiously. If passed on to an undeserving person, it was believed that the act would desanctify it, as a consequence of which the medicine would become ineffective. Therefore in folk medicinal practice most of the cases of transfer of medicinal knowledge take place strictly according to kinship relations. Thus we can see a very complex politico-cultural process of institutionalisation of this medical practice.

In this process of institutionalisation of folk medical practice certain peculiarities can be identified. Since the transmission of knowledge takes place within kinship network, the knowledge is generally restricted to a caste or a community. Hence, folk medicinal practice becomes a private property of an individual or individuals belonging to a particular kinship network. But it should be remembered at the same time that this knowledge was of help in the form of common good

without any expectation of a return. The continuation of medical knowledge in the kinship network is a distinct feature of traditional societies.

This paper discusses the above subject bearing in mind the larger issues directly or indirectly related to it. For, this researcher believes that the debate on the transmission of traditional knowledge in folk medicine can not be undertaken in a vacuum. Consequently, the discussion has to be situated in the context of the debate on tradition and modernity. Therefore the paper seeks to explore the question of possibility and desirability of safeguarding folk medicinal practice and applying it to the modern world in this larger milieu. The researcher is aware that both in natural and human sciences great debates have been taking place in this area keeping in mind all that the paper seeks to examine the following issues:

- If we consider the folk medicinal practice as a pre-capitalist phenomena how could be safeguard and apply it to the capitalist and the post-capitalist world; is it possible to do so; is it desirable
- assuming that such an attempt is both desirable and possible by doing so does it not result in the hegemonic domination of modernity over tradition.

Hlt-65 Pottali Rasayanas with Special Reference to Hemagarbha Pottali

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Metal and minerals are being used as medicine in the form of churna (Powder) since vedic period. From 8th-9th century A.D. all the pharmaceutical processes have been revolutionized due to introduction of mercury which plays an important role in potentiating the efficacy of drugs and maintaining the positive health of a person in the form of different mercurial preparations. Besides this the mercury disintegrates the minerals and metals in such a finer state that they may be absorbed and assimilated in the biological system as well. Though the mercury itself is a very toxic material but becomes therapeutically highly beneficial when it undergoes various pharmaceu-

tical processes, described in Ayurvedic texts.

Ayurvedic mercurial preparations are considered the top most drugs in the field of Ayurvedic therapy due to their specific qualities like long durability, minute dose, tastelessness, odourlessness and Rasayana effect etc. out of such preparations, Pottali Rasayanas are very prestigious, generally used in last stage to save the life of the patient. Pottali name is given to these preparations due to their conical shape which is formed by an aggregate of several drugs. This type of preparation came in to light to save the drugs. This type of preparation came in to light to save the drugs from loss due to breaking

of their containers or malhandling etc. This form is also easy to carry from one place to another as effect of several drugs

can be achieved by single form only. It is very convenient regarding therapeutic dose too.

Hlt-66

Eugenic Principle of Ancient India

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A good child of good parents with due education is the normal asset of the country & its deviation deteriorates the urge of right conception and makes the entire regime deviate. - (SRI SRI THAKUR ANUKULCHANDRA)

The words of Swami Vivekananda, Prophet (md.) and other Maharsis and other examples of Abhimanyu, Pradyumna, Samba, Sivajee, Rana Pratap, Sri Aurovinda, Swami Vivekananda & other genii born in India inspires us to find out the developed eugenic principles of ancient India.

Ayurveda, the science of life describes:-

*Dhruvam Chaturnam Sanniddhyat Garbha Syad Vidhipurvakam,
Ritu Kshetrambu Veejanam Samagryat Ankurah Yatha*
(SUSHRUTA)

*Aharachara Chestabhi Yadrusibhi Samanvitau,
Stripuamsau Samupeyatam tayoh putrahapi tadrusam*
(SUSHRUTA)

The above descriptions give importance to parents & the environment. So the Ancient seers of India advocated good moral character for both girls & boys, proper marriage, chastity, proper way of mating, proper care of pregnant women and the influence of environment on birth. Some of the principles advised are quoted below.

Man should be concentric to God and his Superior Beloved & women should be concentric towards their husbands on the way to the Lord- & Aurora of chastity arises. - (Sri Sri Thakur Anukul Chandra)

This quotation can also be applied to the life of boys & girls to develop their good moral character concentric life can give

good health in all directions - Physical, Mental, Social & Spiritual. So for the alround development of human being Varnashrama was advised by the Indians.

Most important aspect of Eugenics is proper marriage. The gist of principles of marriage is quoted as below.

Every one should marry in families of similarity equal status of culture, customs & characteristics & in clans of different blood & heredity; A male should marry a female of similar or a little lower heredity, culture and conduct; And a female should marry a male of similar or fulfilling higher heredity, culture & conduct; this in a nutshell approx a good eugenic wedlock. - (Sri Sri Thakur Anukul Chandra)

The use of Vajikarana, Pumsavana Samskara before mating, the astronomical consideration of time of conception, the Garbhadhanasamskara proper have its own importance.

The consideration of 6 types of Garbhabhavas I.e. Matruja, Pitruja, Satvaja, Satvaja, Atmaja, Rasaja, Garbhabridhikarabhava Garbhopaghatakarabhavas And Garbhinicharya as described in Ayurveda gives the importance of Samskara, the effect of environment on the foetus and the importance of parents at large.

All the above consideration gives discriptions of a developed eugenics in Ancient India but all these awaits Research and Practice.

The present paper will analyse the Ancient eugenic principles and their importance in the present day society by considering the principles of genetics.

Hlt-67

Certain Folk Remedies Prevalent in Orrisian Culture

N.C. Dash

The study is a brief exploration covering the implication of traditional skills in health care delivery system particularly in the Socio-Cultural milieu of the state of Orissa. The information are data based at par with the ancient compendium.

Unlike other regions, people of Orissa have specific choice over food habits and the menu varies according to the economy of the family. However some common edibles are being used either in festivals or as daily food.

On occasions the ingested food turns to a sequence of food poisoning affecting an individual, a family or a habitation, exposed to a particular food. During such events specific folk treatments are installed which has been culturally inherited from time immemorial.

Introduction

Traditional medicine is nothing new. It has always been an integral part of human civilization and culture. Culture is

defined generally as the sum total of the life style, society pattern, belief, attitude and food habits befitting to the environment. This is the way through which a community attempts to survive and solve its problem.

The food habit of an individual corresponds with the body requirement. He is accustomed to the edibles which is homologous to him. These edibles nourish the body tissues. But the same food induces disease when used in the form of Mithyayoga, Atiyoga or Hinayoga. Surprisingly there is instant cure to get rid of it by using folk medicines. These are in use among the people of Orissa and existing in traditional form which could be ascertained as databased at par with the ancient literatures.

Aim

The aim of the topic is to implement the skills (existing in Orissan Culture) particularly in the rural area, where it is relatively cheaper, socio-culturally accessible and acceptable.

Material and Methods

1. Excess intake of rice causes indigestion and in the event people use to drink water kept over night and normally cold.
2. Inhabitants of rural Orissa are habituated in taking coconut and palm, in the event of indigestion 10 to 20 grams rice powder is prescribed.
3. In the event of indigestion caused by banana, people used to have 5 ml. (One tsf) cow ghee followed by warm water.
4. Jack-fruit is commonly used as raw as well as ripped. In the event of indigestion plantain is eaten as a remedial source.
5. Mango is a lovely fruit in India and Orissa too. It is an wealthy crop during summer and over-eating causes problems in the G.I. tract leading to vomiting and diarrhoea. Commonly people used to take hot milk about 250 ml. at a time to over come the adverse sequence.
6. Flat rice is a common food in Orissa. It is largely used during festival as well as it is consumed daily. Occasionally it causes indigestion and in the event. Powder of long peper 500 mg to 1 gm or Yamani choorn 1 1/2 gm to 2 gms are used followed by warm water as an effective measure.
7. Each month in Orissa passes with a festival during which edibles are prepared with ghee which sometimes induce sufferings like indigestion. In the event lemon juice about 10 ml (2 tsf) or black peper of 1 1/2 to 2 gms (little less than 1/2 tsf) is used with warm

water.

8. Various items are usually prepared in Orissa during festivals with cheese. During indigestion simple cool water is prescribed at intervals.
9. Vegetable rice (khechudi) is very popular in Orissa and rock salt 1 to 2 gms saturated in water is prescribed during indigestion from it.
10. There are varieties of sweets known as Khaja, Gaja and Ladu in Orissa. Clove powder is prescribed (1 to 2 gms with water) during indigestion.
11. Fish is a favourable item of food in Orissa. Among the edible products fish is cheaper and a likely food in Orissa. In social function it is served as a delicious item. People are seen suffering out of excess intake and in such events, Kanji (sour rice water) or unripe mango are prescribed. Similarly indigestion caused by mutton, beef or chicken is managed by Ambula (dry mango powder) or the milk juice of papaya about 5 drops.
12. A disease state caused by excess intake of vegetables is managed with mustard seed powder in a dose of 1 to 2 gms.
13. Indigestion caused by milk is effectively managed by 50 ml of curd at a time.
14. Kakudi (Cucumber) is massively used and during indigestion atta (wheat) powder is prescribed.

Conclusion

The meaning is that the plant medicine grown locally are best suited and beneficial for the patient belonging to that locality.

Justifying the validity of the quotation, I may refer the observation of Oladeji (1986), that the medicament collected and prepared from the immediate environment are likely to suit the body of local patients more than some imported drugs. If this is the situation and date abroad we must change our mind to pay regard to our own culture, heritage and above all the art of Science Ayurveda.

It can be stated that traditional skill in* health care system are nothing new but existed for century for the benefit it carries.

Safety and economy are the advantage associated to it. Keeping behind the above narration the potential skills within traditional system should be promoted for wider use and benefit of mankind.

Hlt-68

Glycemic Response to Selected Cereal based South Indian Meals in Non Insuline Dependent Diabetics

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Diabetes is a disease of complex etiology with a condition of chronic hyperglycemia and its prevalence varies greatly

among countries and populations. Interpopulation variations are mainly attributable to dietary habits. In the management of

Non-Insulin Dependent Diabetes Mellitus (NIDDM), diet has been recognised as a corner stone of therapy. Indian diets are cereal based ones and diabetes is a common disease among the middle or higher income strata of Indian population. During the past few decades, dietary modification in the treatment of diabetes mellitus has advanced from alteration in nutrient constitution (mainly Carbohydrate) of a meal to alteration in the whole meal itself. For many years, diabetic individuals were encouraged to consume diets high in fat protein and low in carbohydrates. But emphasis has been put recently on a more liberal use of carbohydrate in the diet of diabetic patients. Equivalent amounts of carbohydrate may give different responses, since the kind of carbohydrate, food from, nature of carbohydrate and method of cooking have a marked influence on Postprandial glycemia. Substitution of one staple food for another in the source of a mixed meal elicited different glucose responses in glucose intolerant subjects. Hence the biological equivalent, i.e. the quantities of cooked food yielding the same effect on blood glucose or glycemic response of a food should be considered while planning diet for diabetics. Most of the earlier studies have not shown whether the concept of glycemic index persists when carbohydrate foods are incorporated in a mixed meal, the most common manner in which they are consumed. Since there is paucity of data on the glycemic response of food ingredients included in a typical Kerala diet, the present study is attempted with a specific objective to assess the glycemic response to selected carbohydrate rich foods in Non-Insulin Dependent Diabetes Mellitus (NIDDM) subjects.

Four experimental lunches were planned for the study which were isocaloric (771 Kcals) balanced, vegetarian and contained 75g equivalent of carbohydrate in the form of staple foods. The staple foods included were Rice, Wheat and Ragi. The remaining constituents of the experimental meals and the method of cooking were the same in all the four lunches.

The subjects for the experiment were selected based on the following criteria.

1. Adult males in the age group of 40-51 years
2. An Oral Glucose Tolerance Test (OGTT) after 75g glucose load to assess their diabetic condition and those subjects with a fasting blood sugar level greater than 140mg/dl and 200mg/dl after 2 hours of glucose ingestion.
3. Diabetic subjects familiar with Keralite diets were selected to eliminate body's adaptation to food as a variable.
4. Type 2 diabetic patients who were healthy and were free from any other complication but using only oral drugs.

To administer the experimental lunches the subjects were asked to avoid drugs for 24 hours and to fast overnight (12 hours) and report at the clinic at 9 am without taking any solid food. The diets were administered after collecting the blood samples to determine their pre-prandial blood glucose levels. The subjects were requested to consume the entire meal within 30 minutes. The blood samples were again drawn intravenously every 30 minutes for 120 minutes i.e., at 1/2hr, 1hr, 1 1/2hr and 2hr. The subjects were also requested to remain non-active and non-smoking during the test period of 2 hours.

Blood plasma glucose concentration of the samples were assayed by using a colorimeter (GOD-PAP method).

The area under the 2hr glucose stimulation curve (AUC) of each lunch was calculated statically after fitting the quadratic regression equation $y = a + bx + cx^2$ where a, b and c were the blood sugar levels at different time intervals and x the time at which the blood sugar level was found to decrease. Glycemic Response (GR) of each lunch was calculated by using the formula.

$$GR = \frac{\text{AUC of test food}}{\text{AUC of reference food (glucose)}}$$

The statistical analysis of the data on postprandial blood glucose levels at 1/2 hr intervals for 2 hrs after the test meal of rice, wheat and ragi showed significant difference between the diets, between periods and between diet and periods. The largest glucose response was demonstrated after the meal with rice as staple food followed by ragi. Wheat gave the lowest blood glucose response. The incremental glucose areas for glucose, rice, ragi and wheat were 324.00, 321.34, 290.90 and 273.44 (mm²) respectively. The Glycemic response for rice, ragi and wheat were 0.990, 0.898 and 0.840 respectively. The response to meal based on rice was significantly greater than wheat and ragi meals (p). The correlation between glycemic response and mean peak rise over the fasting blood sugar level showed a highly significant positive correlation.

The present study confirmed the important role to be played by wheat in the diets of diabetics and the data provides rationale for designing diabetic diets containing complex carbohydrates in a form which is slowly digested and absorbed. The results stress the importance of type of carbohydrate in regulating blood glucose levels and support the use of glycemic response in constructing diabetic diets aimed at improving blood glucose level.

Hlt-69

Pandaya Tamizhagathil Maruthuvak Kalai Medical Education in Ancient Tamil Nadu

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Included as paper no. 16 in the Tamil section

Hlt-70

Dina charya - A practical approaching maintaining congenial health

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These are three prime pursuits in life big pursuits of life, wealth and of the after life among which pursuits of life plays a pivotal role by which sound health is attained which is the root of virtuous of art, acquisition of wealth gayful life etc.

Priority has been given to longevity, maintenance of health. Prevention of disease, which can be brought about by Dinacharya, Ruthucharya, Aahar, Nidhra, Brahmacharya, Sadhuru.

In the era of fast life from day to day Dinacharya plays a major role in attaining health and happiness. Dinacharya are the activities to be followed from dawn to dusk. It is practised by all of us still we fail to practise the same in a systematic way these practise the same in a systematic way these by benefits are not obtained.

To obtain maximum benefits and to restrict from disease. The following steps of Dinacharya have be followed methodically & Regularly. The dai-an alternative to androcentricism and modern bio-medicalisation

Hinduized cultures have celebrated this fecundity in a myriad of forms. But these celebrations and representations are not unproblematic. On one hand the dominant Indian cultural traditions valorize woman as mother while controlling female sexuality and delimiting her powers in socio-political-economic areas. On the other precious women-centered knowledge systems about birth, herbal medicines and holistic approaches to female physiology (which are still in practice in slums and rural areas) are being erased by medicalization and promotion of pharmaceutical cures for normal female physiological processes. Also women's bodies and female fertility are the targets for ruthless family planning measures. Put simply the female body is being problematized by Western bio-medicine in the name of development.

Contemporary India is informed by these manifold traditions, epochs and representations of female and male corporeality-

much to the chagrin of Indian and foreign bio-medically oriented health and population policy functionaries. And so woman-centered perspectives on ancient and often competing traditions are certainly relevant to current discourses on population, reproductive health, family planning and female fertility.

But a review of the literature available in these fields shows almost no systematic, unbiased documentation of traditional midwives' cosmologies, ritual interventions, herbal knowledge, indigenous representational understandings of female physiology and energies, not to mention notions of divinities and demons, spirit guides and religio-cultural ideas.

In some circles, however, the Indian midwife, the dai, and the ethno-medical knowledge systems she inherits, are beginning to be taken seriously.

Throughout the developing world, in localized and particularized cultural sites, midwives have imbibed their craft by apprenticeship with an experienced midwife. Marglin writes of craft as immediate and personalized work-as opposed to mechanistic and commodified labor. *Craft skills can only be learnt by directly copying the bodily actions of a skilled person during a period of apprenticeship. The acquiring of a particular craft skill is not mediated by abstract generalizations of the work process, or by a purely intellectual analysis of the way the body must perform in order to achieve the desired result.* Jordan states that the apprenticeship mode of acquisition of midwifery skills involves the ability to do rather than the ability to talk about something and posits that in fact it might be difficult to elicit from people operating in this mode what they actually know and do.

Midwifery training programs in use throughout the developing world are attempting to replace this locally appropriate bodily performance and embodied knowledge. Authoritative and didactic, classroom based teaching utilizes systematic visual, oral and written representation of female corporeality derived from Euro-American culture. Surely the traditional knowledge

systems of the Indian midwife, subjugated by both Brahmanical priestly and globalized bio-medical systems, needs to be considered in current Indian feminist attempts to theorize the body.

As mentioned above, Eastern religio-cultural traditions like yoga, meditation and Ayurveda are being recognized as possessing valuable alternatives to reductionist bio-medical constructions of human corporeality. Why would the knowledge systems surrounding childbirth, with the midwife as ethno-medical practitioner, not also be of value? Because they have been primarily in the hands of low and outcaste women? Ritual texts and midwives narratives can give voice to these subjugated knowledges and provide us with empowering representations of female fertility and corporeality. From 1989-we have committed ourselves to this cause, with the help of more committed young rural women, who have proved themselves that they could revive the Community's traditional knowledge and practice of Herbal Medicine as well as Organic Farming practices. Simple documentation have been done. What are the most prevalent diseases in the villages. What are the simple Herbal Medicines or Siddha Medicines that have helped people for many years, are valuable documentation.

That human health may be related to the deficiencies, when animal trouble are localizing themselves more and more according to soil fertility deficiencies. If one looks at the map of polionyelites in 1946 for example, it is significant, that this health trouble was more severe in those states where the less acid soils give deficiencies in phosphorous for plants and animals. If soil health is deficient, the good produced therein is also to be poor, in one or more minerals and Vitamins. Soil health could be improved by farming or organic lines, by using Organic Compost manure.

The use of chemical fertilizers would only affect soil health for the worse and to that extent, the incidence of polio could also be attributed to chemical fertilizers. By proper soil treatment on natural line, and by a suitable system of crop-relation, soil deficiencies could be set right to a great extent"

Food must be produced, the organic way and also it must be eaten the organic way which is the prime concern of women in each family. The more refined, the more purified, the less would be the most essential nutrients-the minerals and the vitamins in it. The advertisements for ready-made food aim at falsifying this fact. Any amount of added supplements will not compromise the nutrient contents in the natural way and its

loss. The cost of such costly advertisements also is added to the ready-made food.

A survey among the tribal of the western ghats in Tamilnadu, a group with a distinctive culture and civilisation, reveals the necessity in maintaining closer contacts with them in order to preserve one of India's oldest and very effective treatment against many diseases.

These illiterate tribal people have a self-built shell around them. And a cautions strategy is to be undertaken to penetrate their obsely-formed unit. This strategy in the form of an able research should strive to bring out the potential in these people which stands incomparable in certain respects. One finds within their grasp what the modern day specialists strive hard to achieve in the field of medicine. This research unit should be so blended with the tribal way of life so as to preserve their originality and individuality.

These tribals maintain a staunch belief that herbs which grown in a particular region are capable of curing diseases which affect the people in that region. Herbal treatment is an art which is to be treasured and practiced at any cost. Herbs as well as certain animal products are used to cure diseases. But nowadays these herbs and other products, a cure against diseases common and rare are going waste since the specialists in this field are rather becoming extinct. With denudation of forest cover some herbs may also become extinct.

It has been found that those tribal people observe the animal behaviour on herbs and extend it to human beings. They also have certain treatments for making women pregnant, this has great relevance to the family planning programme.

Also the tribals who once never even considered the possibility of disclosing their secrets, now lay themselves open to the outside world for they fear that this knowledge would die with them. So the research team stands to gain in extracting this precious knowledge from them. These tribal people do not have successors among themselves interested enough to practise these skills. So we find a group of anxious poeple on the verge of passing on their skills to those who are willing and interested enough to learn, preserve and practice them. India, with her deep-noted sense of preservation of her ancient culture and civilisation should not let go this opportunity in doing the same with the help of able research scholars.

Hlt-71 Medical Plant Diversity of the Topslip MPCA, Anaimalats, Coimbatore District/Tamil Nadu

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For a research project sponsored by the Foundation for Revitalisation of local Health Traditions, Bangalore on the Medical plants conservation Area Programme, efforts were made to

enumerate plants that occur in Karianshola forests, Topslip, Anaimalais, Coimbatore District. Tamilnadu during 194-95. About 300 species were collected and studied in detail which

constituted 75 trees, 25 shrubs, 40 climbers & twiners and 160 are herbs. Some rare species that were collected during this investigation are *Anodendron rhinosporum* Thw. (*Apo Cy-naceae*), *Antiaris toxitaria* (Pers) Lesch. (*Moracea*), *Arisaema barnesii* Fischer (*araceae*), *Curcuma Pseudomontana* Grah., *C.Zeodoria* (Christm) Roscoe (*Zingiberaceae*), *Diospyros*

bourdillonii Brandis (*Ebenaceae*), *Habesoria multicaudata* Sedgewick (*Orchidaceae*), *Geophila reniformis* (L) Johnston (*Rubiaceae*), *Piper galeatum* C.DC. (*Piperaceae*) and *Sageraea dalzelli* Bedd. (*Annonaceae*). The present field observation indicate that the biodiversity of the medicinal plants in the area in question can be best conserved only *insitu*

Food & Nutrition

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It is essential to consider the place of food in our life in a comprehensive, holistic and evolutionary perspective to understand its key role in supporting all forms of life in the world. The human being and the world of plants and animals have lived through millennia consuming food but the human being has not merely lived to eat but he has eaten to live a life of higher values. We have to consider this gap between living to eat and eating to live as a series of steps necessary to imbibe humanistic and spiritual qualities. Modernism and traditional way of life can pursue the goal of humanistic and spiritual ends in a progressive manner by considering food in its holistic sense as one of the means to attain this end.

In Indian tradition, food is considered as the gift of a goddess with the ingrained characteristic of wholeness. The goddess perceived as a symbol of omnipotence, Annapoorni, fulfills all the material and spiritual needs of humanity. There is thus reverence for food among the common people and hence precludes wastages; there is also the dharma or righteous duty of the human being to share his food with all beings. In the cosmological sense, food is a primary and vital support to all life-bearing entities. Such beings in the cosmos include rupa devas or cosmic intelligences with form but the food to sustain them is not material food but pure feelings and thoughts of human beings. Thus the holistic perspective becomes spiritual when understood in the comprehensive true spirit.

The chemical elements of carbon, oxygen and nitrogen constitute the carbohydrates, proteins; fats, vitamins and other constituents of food.

Considering food and man in the historical perspective, the choice of vegetarian food by the human being is seen in the best interests of overall economy and it is also a wise choice from the ethical and holistic point of view. It dissociates man from the cruelty of killing animals being influenced by the animal magnetism. Our ancients derived their food from plants imbued with a holistic concern for the welfare of all.

From the global and local points of view, food must be shared by all, for the overall benefit of all and by employing means that are of intrinsic value in evolution of all in Nature. The International organization, Food for All, has pointed out that sufficient food for feeding all the people in the world is actually being produced but it is not made available to the people who are in need of the same. Thus the world hunger is a reality but artificially created.

Generally food is considered fit for human consumption if it is natural and wholesome. But under modern living conditions it is difficult to obtain such food. So food should also be considered as sanitarily pure, free from adulteration and to contain a judicious balance of different ingredients helpful in maintaining a healthy life.

The constant vigil of the human being should be towards higher life and values and it must be remembered that food has a key role to play.

F&N-2

Food from Trees

A.N. Henry & C.R. Ramanathan

The role of trees, as a source of diverse food, fodder, timber, fuelwood, medicine and raw materials for a number of forest-based industries, is well-known. While direct contribution of food from trees is thought to be comparatively less, the available scientific data suggest that nutritional contribution of certain forest/farm trees can be important for the practical plant users. The forest/farm trees do make significant contribution to the food security of the tribal and rural populations. Food from trees is obtained mostly from fruits, seeds and nuts (starch, protein, fat and oil), and pith (starch). Studies on the nutritional value of these foods undoubtedly encourage people to consume foods that provide them with a better balance of starch, proteins, vitamins, minerals and other nutrients. Ten potential tree species which are rich in protein and starch are recommended for planting to strengthen food security and alleviation of poverty. These trees have an attractive commer-

cial future in food industry; the cropping pattern should however be improved through careful genetic manipulation and agronomic selection.

1. *Aegle marmelos* (L.) Correa [*Rutaceae*]
2. *Artocarpus heterophyllus* Lam. [*Moraceae*]
3. *Balanites aegyptiaca* (L.) Del. [*Balanitidaceae*]
4. *Carissa carandas* L. [*Apocynaceae*]
5. *Holoptelea integrifolia* Planch. [*Ulmaceae*]
6. *Mangifera indica* L. [*Anacardiaceae*]
7. *Phoenix sylvestris* (L.) Roxb. [*Arecaceae*]
8. *Pithecellobium dulce* (Roxb.) Benth. [*Mimosaceae*]
9. *Sterculia urens* Roxb. [*Sterculiaceae*]
10. *Tamarindus indica* L. [*Caesalpinaceae*]

India has been in short of food since a very long time although there is slight improvement recently. Apart from cereals, the amount of vegetables, fruits and seeds produced is also inadequate. To help feed, clothe and house a rapidly increasing population, it is timely to consider unconventional (and neglected) or little-known plant species. It is well known that our sages lived in the forests and derived their sustenance from the forest itself. Many of the wild plants yielding fruits and vegetables are collected by the local people/hill tribes and sold in the market. Such plants occasionally provide much needed food and varieties to mountaineers, plant explorers and tourists, and the local population has to fall back upon them only in times of scarcity.

The state-of-art-report on these unconventional or less-known useful plants of India is yet to be prepared. It is estimated that about 20% of the 16,000 higher plant species are useful. Edible plants including cereals, pulses, fruits, vegetables, etc. are esti-

mated to be about 2,000 species but only a fraction of them have been commercially cultivated to some extent. Many less-known species have potential nutritive values and can be of economic significance in augmenting the existing food/vegetable resources of the country. The cropping pattern of them should, however be improved through genetic manipulation and agronomic selection with a view to achieving commercial sustainability. It is unfortunate that most agricultural scientists are unaware of the scope and potential offered by tropical botany.

Some of the unconventional but potential plants (also new food resources) fit for commercialization are given as per the parts consumed as food, viz. Roots, tubers and rhizomes; Young shoots and leaves; Flowers including buds; Fruits; and Seeds and nuts.

These list of plants will be described during presentation.

F&N-4 APONG : The Popular Fermented, Nutritive Beverage in Adis, Apatanis, Nishings and Mishings of Arunachal Pradesh

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In this paper the value of Apong as a sociocultural matrix in Adi, Apatani, Nishing and Mising societies is discussed. Its chemical screening reveals that apart from a very little alcohol, minerals and vitamins, it is rich in food value. In anthropological and social perspectives, it is an unifying force of a society. The author also writes about the dangers posed by its distillates form i.e. RAKSI, to the youth of this area.

Introduction

Apong, i.e. rice or millet beet is not only an important part of the diet of Arunachal people, it plays an important role in their religious and social ceremonies. In ancient time, when there was no paddy especially during natural calamities the earlier man not only survive but kept himself healthy, active and cheerful in all abnormal weather conditions and hilly tough terrains, only by this fermented beverage.

In Lower Subansiri, on Nyokum festival, this Apong keeps people dancing and enjoying, reminding them the eternal truth *Dola dola daiya hakin, dagla dagla hopo pakin* i.e. if we get together, live together, walk together, our unity is strengthened.

Apong the strength and vigour of the youth is present in almost each and every local house. It is a customary to have apong in an Adi house as it is a belief that where there is no Apong, the almighty Donyi-polo does not exist in that house after a day

hard work, he is relaxed from his tiredness by the deliciousness and sweetness of the Apong. The reception of a guest in an Adi house is done by serving a glass (Mug) of Apong.

During the celebration of Mopin festival, Apong become the platform for the healthy interaction of man with mother Nature.

The art of making Apong (Apatani/Nishing): The boiled rice or millet is taken in *pua*. The proportionate amount of yeast tablets is added to it and the whole bulk is converted into paste. This paste is allowed to undergo the process of fermentation by keeping it on darreke above fire for 2 to 5 nights. The fermented substance is added into a sadder (bamboo/cane made of funnel) and the hot water is poured slowly along with the walls of funnel. The filtrate known as Apong is collected into *Pogia* (Pumpkin container) or *yakhang* (bamboo container).

The most concentrated beer is known as *spotu*; less concentrated as *Podam* and very less concentrated as *Pokha*.

Conclusion

It is evident that apong is nutritive liquid food which provides good physique strength and endurance. When taken in small quantity, it stimulates. It intoxicates if large quantity is taken. In Arunachal Pradesh, where unfavorable weather is very common, taking apong cannot be a superstition but it is a must to keep oneself health, active and cheerful.

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Food, Health and Nutrition are the tripod of life. As they are basic needs of life, they are very closely related with each other. Focus of research of ancient Indian medical science i.e. Ayurveda was more on health and food than disease and medicine.

Ayurveda accepts and emphasizes on-prevention is always better than cure.

The slogan of WHO (World Health Organisation) is-Health for all by 2000 A.D. But the slogan for Ayurveda is All for Health.

It is said that Health is Wealth. And it is known that Health and food go hand in hand. Human being need good food and digestion for good health.

Discrimination of food

Food contains all the energies that go to make up the forces of our body and mind. Just as the force and matter, we find the material world become body and mind in us, So, essentially, the difference between body and mind and the food we eat is only manifestation.

Ahara-shuddi is one of the principle factors in our life.

Types of food

1. Sattvika food
2. Rajasi food

3. Tamasi food.

Sattvika food contains proper amounts of fats or oil, stable pleasant etc. This food is healthy.

Rajasi food are onions, garlies and all evil smelling foods. Such spicy, hot food increases Rajaguna of mind. This food produces many diseases like acidity, ulcer etc.

Tamasi food that has been standing for days till its condition is changed, any food whose natural juices have been almost dried up, any food that is malodorous, should be avoided.

It is said that life is re-composition and death is decomposition. Therefore, what better material is there than nourishing food for recomposition of various elements and the mind which sends out infinite waves of thought? But if that food which goes to sustain the body and strengthen the mind is not properly assimilated and digested and the natural functions of the body do not work properly, then that very thing becomes the root of all evil.

Hence our digestive system should be normal.

According to Ayurveda, almost all the diseases are produced by disturbance of Agni. And if this Agni cease, man dies.

So, let us walk in the spirit of Sattvika food to redeem our soul and remind our mind, which will be the sunshine of mind and will be the best source of Health.

Are We Eating too much, or Enough, Fat?

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Is Indian food really too oily or greasy? Is it true that we use too much fat? What kinds of oils or fats does the human body really need, and how far do our traditional eating practices stand up nutritional scrutiny?

Let us look at the evidence.

Usage of fats

Dietary surveys show that in various regions of India, the daily usage of total oil varies from about 20-3 grams on average per head per day.

Oils and fats are very rich sources of energy. Taken together, visible and invisible fats present in Indian diets contribute about 13.2% of the total energy in the diet. This is a low figure, though the 30-40% average in developed countries is considered too high.

Groups of population

The very poor would of course be below average, but by how much? Calculations show that they get just 10% of their energy intakes from fats, and this is naturally mostly invisible fat.

At the other end of the scale are upper income groups. These are essentially city dwellers, and how do they fare? Rather strangely, with even slum dwellers in cities averaging 13% energy as fat, the same as the all-India average.

Fat quality

All fats are made up of saturated fatty acids Monounsaturated or oleic acid and polyunsaturated or linoleic acid, in various proportions. A few also a little linolenic acid.

In diets all over the country, estimates show that these are present in almost exactly equal proportions, one-third of each.

ICMR recommendations

Based on data of this sort, the ICMR suggested that Indian adults take about 20 grams a day of oil or fat, older children about 22 grams, young adults about 25 grams, pregnant women 30 grams and lactating women 45 grams. The oil chosen should contain at least 20% of linoleic acid, for example groundnut, sesame etc.

Certain other factors are relevant. A lot of new evidence is emerging about the importance of substance called antioxidants which are present in certain oils. In particular, these are palm oil or palm olein, ricebran oil and sesame (gingelly) oil. The extra linolenic acid that one needs could come from a little mustard oil, or by use of fish which contains its derivatives. Affluent people need to cut down on their use of cooking oil following ICMR recommendations, cutting down on use of fried foods and snacks rich in fat.

F&N-7 Manidha Vunavin Vilakkam Arokiya Padukappum, Sathulla Vunavum Explanation of Human Food, Safe Health & Nutritive Food

N.K.Sriramulu

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The basis of health, the criteria of nutritive food, the specially of organic food are described in this paper.

Included as paper no.17 in the Tamil Section.

F&N-8 Vudal Nalathirketra Vunavugal-Food for Good Health

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Foods needed for keeping good health are illustrated in this paper. It emphasizes on organic food.

Included as paper no. 18 in the Tamil Section.

F&N-9 Tapyo & Khar : Nutritive Food Ingredients (Arunachal Pradesh & Assam)

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Chanting *Taku Tapyo Bai Alo*, the Bulyang elders enter into a host village of Apatani valley during Myoko festival and the whole host villagers welcome the wise Bulyang members with *O* (Apong) and Tapyo.

What is Tapyo? It is mentioned as *Apatani Black Salt* in anthropological books. How is it prepared? An Anthropologist writes *As a substitute for salt the Apatani boil down the ashes of burnt ferns and other plant which they find in the forest and make a cake of a kind of Potash*

What is its role? Is there any scientific aspect associated with it? It is generally taken with rice/millet beverage (Apong) because of which it is also known as *O Tamnanii*. *It provides alkaline medium to the digestive system. It checks the alcohol from being converted into acid. Since 'acidity trouble of stomach is very rare in this area, it may be considered to be a natural soda.* Perhaps it is the only and only one food-habit which makes the Apatani society different from the others. Does this item of food habit keeps the whole Apatani valley free from Goitre while the whole Himalayan food-hills is under epidemic goitre belt.

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In the present world we are confronted with various pollutions - water, air, noise, food etc. The modern man does not realise the importance of a properly regulated life, as he has to spend more time and energy in earning for his livelihood and adding to his comforts. The facilities given by the tremendous growth in scientific and technological fields have virtually made man lazy and his life mechanical. The various physiological and psychological disorders are visible everywhere.

The ancient seers have given many useful prescriptions for men to lead a perfect life in a calm and peaceful way, and in tune with Nature. From the Vedic period onwards, great emphasis was laid on a disciplined life with moderation and balance in all activities. The scriptures and texts on Ayurveda and Yoga caution that food plays an important role in our life. Since purity of food leads to purity of body and mind, these texts deal elaborately with the quality and quantity of food to be taken by men of different categories.

The yogic texts classify food into three categories - sattvic, Rajasic and Tamasic. Some texts give the list of food which

should be taken and which should be avoided. The great yogis also advise that one should not eat more or less and one should not practise yoga immediately after meal; nor when one is hungry. A yogic student who spends his time mostly in pure meditation may need little food. But a yogi who ascends the platform for vigorous active work needs abundant nutritious food. Hence a balanced diet viz Mitahara is advised.

Vegetable diet has been acclaimed to be most conducive to spiritual and psychic advancement. Meat eating and alcoholism should also be avoided. Even among the vegetables, certain varieties have been recommended as ideal for physical good health. Besides the food, yogic texts deal extensively about the need for cleanliness of the body, mind, surroundings, atmosphere etc. Equal attention is given to ecological problems too. By leading a simple life, in tune with the Nature, one can have a long and harmonious life. If the modern man follows at least some of these principles, it will help in his physical, mental, intellectual and spiritual growth.

F&N-11 Indigenous Food Technologies used by Women in Andhra Pradesh

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The women workforce are largely employed in the agriculture sector. They participate in allied sectors of agriculture such as dairy, sericulture, agroforestry, poultry forms, horticulture and so on. The women's participation in agriculture and allied sectors in turn gives rise to various household industries such as food processing, food production and food preservation. Additionally women also collect spices, nuts, oilseeds and other related material for consumption or utilization purpose. This paper wishes to focus on the existing indigenous technologies used in the food production, food processing and food preservation by women in the Rayalseema Region of Andhra Pradesh. Data was collected on the following aspects:

1. The indigenous technology used in processing of staple foods, and perishables such as milk vegetables and fruit as also the effect in terms of enhanced shelf life and quality of these foods.

2. The traditional tools and techniques used for storage of the foods
3. Preparation of special foods of the Rayalseema Region
4. The innovative approaches to food preparation by women.

The data was collected using the personal interview technique from 50 women in Chittoor District. The technology used by the women is assessed for

1. Ecological sustainability
2. Economic viability
3. Employment
4. Credibility to the women

Strategies for sustaining the indigenous technology used by women in food production, food processing and food preservation are also out-lined.

Education

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It seems to be that learning is one of the deepest instincts in children. They are acute observers of the environment and learn many significant things like language, without being taught. There seems to be another set of thing - skills and ideas - the learning of which need a more directed interaction between the adult and the child.

In today's context, the task of providing directed learning has become the exclusive domain of schools and colleges. This monopoly, so to speak, can be questioned from many points of view. Three streams of questions seem to emerge:

- (i) Are schools/colleges (anywhere in the world) really fulfilling their stated objectives? A look at what goes on in educational institutions and a comparison with what is said in the prospectus of these institutions will amply illustrate the point. Social scientists like Foucault have demonstrated that schools, prisons and institutions for the mentally disabled are isomorphic! May be then the question to ask is, can schools/colleges as they are structured now, be entrusted with the crucial task of helping children grow into adults?
- (ii) Can schools/colleges which are very resource intensive ever meet the needs of education in the Indian context? Today, to start a school, the investment required seems to be of the order of Rs.25,000/student in infrastructure alone! Clearly, education at this price will necessarily remain a rare and inaccessible commodity. The question that arises then in education be so structured and delivered that it is low on infrastructure and other costs which ensures universal access to it.
- (iii) The monopoly of schools and colleges has made other ways to learning illegitimate. A peculiarity exists: only a degree from a modern university is considered valid today. Yet, if you examine the situation, it is this degree that does not guarantee competence. It is a fact that you can get a degree in engineering and not be a competent engineer. Contrast this with ways of learning that are today not considered legitimate. A cycle mechanic learns his trade from another cycle mechanic. It is true that there are no grossly incompetent cycle mechanics who are practising this art.

Karl Marx once said that banning child labour, while being humane, unfortunately deprives the child of his opportunity to learn. The point seems to be that work and other adult domains are actually very rich grounds for participation and learning for the young. Institutions as we have them today are divorced from the world of meaningful productive work. This separation of education from work, its application, is a modern phenomenon and it seems to be at the root of many of our difficulties in the educational sphere today.

In a post-colonial society such as ours where the task of reaffirming our collective and individual identity and rooting it in our cultural context is of prime importance, the wisdom of persisting with and actively propagating a colonial way of educating the young seems absurd. There is much to be said in support of the cliched statement that the education system was designed by the British to ensure a steady supply of clerks and babus and it continues to do so even today.

Like everything else in the world, educational systems across cultures are becoming clones of western institutions. Surely, there must be a way of educating our young which is necessarily unique and culture specific. After all, young people have to grow to become a part of their culture and contribute meaningfully to their societies. Modern education in India is destructive of the students' moorings and ensures alienation. This globalisation of education is what is at the root of the so called *brain-drain* by creating both the cherished ideal of the west in the minds of the student and by ensuring that the student does not have any skills that he/she considers usable in his/her own context.

A society and its institutions evolve together. Any new variation in the system draws from the existing very strongly. This is both natural and healthy in that there is change and continuity going hand in hand. Education in India today seems to have not drawn from its historical experience and expertise at all. This is a tragedy and perhaps there is much scope for correction here.

In this context, a look at the ways in which the Indian civilisation addresses itself to the task of helping children becomes useful and productive members of society will be useful in terms of insights and directions for the present. Like in other areas, here too we find diverse and efficient institutions and strategies to successfully meet its needs.

Dharampal in his book *Bharatiya Chitta, Manas and Kala* quotes Samdong Rimpoche, the Vice-Chancellor of the Buddhist University at Bodhi Gaya as saying (at a conference of Vice-Chancellors) that most of what the others were talking of as education did not come under that category for him at all.

The exact nature of education in pre-British India seems to be lost in time and consciousness. But what glimpses we seem to get are fascinating and without exception with valuable insights for contemporary situation.

Dharampal in his *Beautiful tree* describes a picture of Tamilnadu where literacy level (for example) is higher than it is today and that literacy was not at all the prerogative of the Brahmins or other elite. Every village had a school and there were also many colleges. The curriculum, writes Dharampal, was comparable to what was taught in European colleges of that same

etc) and productive economic capacities where they worked on par with men/complemented men's roles. How is such knowledge transmitted?

One of the characteristics of the modern educational system is its ability to do research and produce change. It is quite evident that traditional processes have undergone modifications like a metal worker using a cycle wheel as part of his bellows etc. The use of dead battery cells in Ayurvedic formulations is another such instance. A good question to ask would be what is the factor in the methodology of training that ensures that the knowledge evolves and modifies?

Like in many other areas, Gandhi seems to have used his unique (and sometimes non-factual) understanding of history to forge a unique brand of education, the Nai-Talim. A study of it would again be worthwhile in our search for a system of education that is rooted in our culture.

In our world today, the modern educational monopoly is ensuring that valuable knowledge is either lost or de-legitimised. Nevertheless, there seem to be even today a wide variety of ways in which people learn and children grow-up to be productive adults. The Traditional Sciences and Technologies Congress would be an appropriate forum to investigate these, to revitalise institutions and to create a whole new educational vision for our times.

Physical Institutions

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or what to make of the behaviour of other people. Whether or not we want to call such traditional knowledge 'scientific', it was the original starting line for the development of all our

Most developing countries have an important stock of tech-

nologies, based on some cases on traditional methods and devices, in some cases on development of new approaches or adaption of existing technologies to meet local needs, but few have carried out the full range of research, analysis, testing and pilot plant studies which are necessary before these technologies can be promoted and applied.

The Universities/Institutions must become relevant to the present context? Students, researchers and teachers do not participate in the real world situation. The education is in a set of narrow disciplines required to fulfill specific functions in the existing production system rather than being holistic.

This paper explores strategic role of universities and Institutions to move out of their mind set and translate existing rural wisdom into viable techniques.

Right to Meaningful Mathematics Education through Indegenisation

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Continuing Scenario

The sense of belongingness evoked in language classes is almost non-existent in mathematics classes and so there is neither fervour on the part of a majority of working teachers nor interest on the part of a majority of learners except preparation for exam passing. It is because the curriculum evolved in respect of mathematics during pre-Independence day has been allowed to prevail with minor alterations and adjustments to reflect world trends. In the words of Kuichhri, meaningful mathematics education is derived to children through formalism and authoritarian teaching regendering passive learning. Only when mathematics is alone through exploration and experimentation can children arrive with confidence and maturity to pursue independent learning. Since mathematics is man made, this aim could be achieved given realisation, funding and refashioning of curricular objectives.

Indegenisation

There is therefore an acute need in the interest of developing on mathematical human resource to concretise, practicalise, dramatise, personalise and culturalise mathematics education to empower children to exercise their curiosity for obtaining meaningful mathematics education right from nursery years onwards. But the need cannot be met unless a massive effort is for healthy revival of meaningful mathematics is made in every state with coordination, monitoring and funding by the centre for collection and dissemination through present day technology based documentation of

- i) folk resources of mathematics from villages including kolams
- ii) applications of mathematics by artisans, temple architects, craftsmen, fine arts people and artists,
- iii) instructional guides working teachers and parents on our Indian heritage of mathematics followed by massive inservice orientation of mathematics teachers particularly in schools with steps to incorporate them in B.Ed and M.Ed mathematics education syllabi.

Immediate steps

To get things started, though late as late is better than never, managements of private schools if not ministries of education in states as well as in the centre, should come forward (i) to conduct like school annual sports annual children's math exposition where mathematical concepts are presented not through charts but through structured situation and manipulation of masenal objects (collected from homes and shops) and (ii) make math practically a part of each terminal examination and (iii) culturalise mathematics through children's fixing of date magic squares for getting scheme function days and staging of episodes and anecdotes from the history of mathematics; Indian in particular and presenting mathemagic show with or without audience participation. Above all children need to be prescribed math learning kits besides uniforms, textbooks and note books at the commencement of each school year.

Edu-4 **Traditional Indian Sciences: Role in making General Science Education Wholesome and Purposeful**

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It is now recognized virtually universally that a certain amount of science should be an essential component of the education of everybody. It is not equally clear as to what is the common denominator in the requirements of actual or would be Scientists, Engineers, Farmers, Labourers, Religious Teachers, and Housewives. Because of this lack of clarity, science curricula deigned as preparation for professional training of Scientists, Engineers, etc. are being thoughtlessly (and painfully) thrust upon everybody.

In defining and working out such a minimum curriculum embodying the common denominator of the requirements of

every-body, traditional Indian sciences could prove very useful.

It should be clear that the common denominator in science for the purpose of everybody (in other words, *Science for the common man*) would be based mostly on our traditional sciences, suitably incorporating modern insights. The natural corollary is that general science education of children as well as adults should not be centred on detailed treatment of chemical formulae, laws of motion, scientific classification of animals and plants, formal definitions, etc. which are neither readily useful to, nor are understood by, a vast majority of students. Instead, there should be greater emphasis (than at

present) on such practical concerns as health, personal and public hygiene, environment, elementary measurements, phonetics, method of observation, etc. This should be done in a way that brings out cause-effect relationships and systematics,

and exposes and kills superstition. In this, Indian traditional sciences can contribute a lot. The paper discusses some examples of this.

Edu-5

Strengthening Traditions: Participatory Research in Traditional knowledge systems

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Introduction

Sahayog is a voluntary organisation working for rural development in the Uttarakhand region of U.P. One of the primary beliefs of *Sahayog* is that in this difficult and inaccessible area, many of the most appropriate technologies are those which have evolved indigenously over the centuries. Fortunately many of these still remain, though *traditional* efforts at development are striving to wipe these out. Over the last three years *Sahayog* has been attempting to conduct Participatory Research in Traditional knowledge areas, and to date two studies have been conducted into Herbal Healing practices and Practices related to Agricultural seed varieties.

Principles

The principle of such Participatory Research has not only been to document the knowledge systems of the people together with them, but to engage them in a critique of their own practises. Various Participatory Tools have been used that have not only encouraged the community to actively participate in generating information but also allowed them the opportunity and space to debate among themselves about the use, relative merits and demerits of the various practises. This process has allowed many within the community to *rediscover* some lost practises, and reaffirm their faith in ones which they might have discarded under *development pressure* and *incentives*. This process of rediscovery and reaffirmation has been a vital part of the participatory research because it concerned itself with the peoples own faith in their own practices.

Tools

The emphasis during the research was not on accuracy of information, and purity of data, but on shared consensus, scope for learning/unlearning, and evolving a shared understanding/critique. Consequently such tools were used which allowed active participation, interaction between not only the

researchers and community but between members of the community as well, and were relatively flexible in their use. Small Group discussions, Group Interviews, Semi-Structured Interviews, Ranking and Sorting, Specimen Collection and similar tools were extensively used.

Limits and Potentials

Both the studies were conducted primarily with women, and dealt primarily with popular knowledge as opposed to specialised knowledge. Women in the region have a tradition of working together in the fields, fetching water together, going to the forest together for fuelwood and fodder, and such were open to sharing knowledge without any spirit of competition within themselves. They were also very open to accepting new ideas thrown up by neighbouring communities. The few men involved in the study were by contrast possessive about their knowledge, and less open to ideas other than what they knew. These very men were very open to modern ideas, while the women tended to be more conventional. With more specialised areas of knowledge such openness to sharing and learning cannot be assumed.

Both the studies were conducted by individuals who had no formal training in either of the two subjects concerned. While this was a handicap in as much that they could not offer *scientific* validation to the community regarding their practises on the spot, they were able to listen to the community and help them rearrange their ideas in a more undirected manner.

Conclusion

Participatory Research allows interested individuals and groups an opportunity to gain valuable and meaningful insights into the how and why and also the *nitty gritty* of traditional knowledge and practices. But even more important it allows community to reassess their own knowledge and practises, thereby strengthening those very practices.

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This paper attempts a perspective on Dharampal's book *The Beautiful Tree*, from the standpoint of educational reality to-day. It divides itself into three sections - one, which recreates the contents of the book in the light of lifestyle and context of the Indian of the early 19th century; two, which explores the values, governmental, social and psychological upon which that lifestyle and context were based; and three, which assesses the way education has evolved in present-day India (with focus on Tamilnadu) and the values upon which it is based from the standpoint of the earlier values.

The reading of *The Beautiful Tree* affords surprises and shocks in plenty. There is wonder at the fact that

What Prendergast wrote of the presidency of Bombay in 1820: *hardly a village, great or small, throughout our territories in which there is not atleast school, and in larger villages, more,* is true of large areas of India. William Adam has made the new famous statement that there were 1 lakh village schools in Bengal and Bihar alone.

The conditions and arrangements of education, the syllabus, the attendance, surroundings and quality of teachers were for superior in India, even in the 1820's when many of the oliver structures had been wilfully broken down, than in Britain at the same time. Munro himself, in 1826, had to admit that indigenous education *has, no doubt, been better in earlier times, than then.*

The structure for distribution of revenue for education was both pragmatic, effective and humanitarian. It had largely broken down by the 1820s, due to centralization of resources. AD campbell, collector of Bellary, reported to Munro, *The transfer of the capital of the country from the native government and*

their officers, who liberally expanded it in India, to Europeans, restricted by law from employing it even temporarily in India, and daily draining it from the land, has likewise tended to this effect.

One of the major shocks is the knowledge that Macaulay Beutincle and others deliberately delayed large-scale school education before anglicized higher learning had first been established in India. Cosmarasneary has said of the ordinary graduate in 1908 that 'He is indeed a stranger to his own land' & this pattern has continued.

Another shock is the drastic cut in the revenue allotted for education in the British regime in Trichy, it is said, 93% of the revenue was slashed. The cold-blooded destruction of the older and more viable system fills one with a sense of what might have been.

There are many meanings to be culled from the valuable book and many questions that we can ask ourselves about where we are as educationists in India today. There is perhaps also some soul-searching to be done about the psychological colonialism inherent in our paradigms of progress, values and knowledge. The rather obvious limitations of the earlier system when seen from these paradigm cast based education, given issues and fixity of social structures, cease to appear that way when one actually assesses the benefits that have accrued to us from the many myths of choice which we have given ourselves.

Yet, a new paradigm needs to evolve, and the challenge seems to rest with the individual educator and local initiatives rather than with the unrealistic expectation of governmental policy change. The paper explores this challenge.

Anil Sinha

Education for all - Literacy a fundamental human right for everyone by the turn of the century. Compulsory Primary education with equitable access to higher education is the goal. We are far from this goal. 960 million adults and more than 100 million children are illiterate.

National Literacy Mission (1990): Brought focus to the need for Universal literacy. It also involved the mass mobilisation of various groups-school teachers, students, voluntary groups etc

Total literacy campaign: These captured the imagination of youth and spread into many areas. Crucial question however

is, why these campaigns are not able to make inroads into traditionally illiterate areas.

Bihar Education Project is an education process with which I have been associated envisages education as an instrument of change through revamping the content & process of education. It places the teacher first and involves them at all stages. Emphasis is on accountability to the local community.

Saaskshar Muzzaffarpur'92 (SAMU) was conceived totally as a local initiative. It deeply believed that there was no dearth of talent in the local area. Originally identified leaders no opposed

o nominated ones were more effective. Efforts were made to identify key workers & volunteers. Using Tola (hamlet) as the real unit was another innovation. This homogenous caste based

group was the real socio-economic unit. Women participated well at the Tola level. School rather than the BDO became the hut of all activity.

Edu-8

Indigenous Toys and Toymakers **A Magnificent resource of Design, Science and Technology**

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Every society has a great deal of practical and useful knowledge. This is often expressed most creatively and effectively through the tales and toys of that society.

The best thing a child can do with a toy is to break it. The next best is to make it. It is indeed in this process of breaking and making things that children learn a great deal.

While collecting material for my books on Indigenous Indian Toys, I came across many simple but outstanding examples of playthings being made by children and artisans. Those ingenious products also are magnificent examples of basic design, science and technology. I had met hundreds of artisans at fairs and melas and at their workplaces. Most of these toy makers had the insights, skills and creative talents which are normally expected of trained professionals.

I have looked at the Indian toys for their educational value too, and have brought out the fact that indigenous toys are not the poor cousins of the modern factory made toys. Indigenous toys cannot be replaced by mass-produced acultural toys. If at all a comparison has to be made between our indigenous toys and the factory-made mass-produced toys, the former have an edge over the latter. Indigenous toys are not only cheaper but are much more rooted in the socio-cultural context of the community and are part of the local cultural ethos. The educational value of the indigenous toys is very high primarily because children can make and break them freely. The simplicity, and the construction in familiar materials can encourage the spirit of inquisitiveness and a process of enquiry.

At the National Institute of Design, Ahmedabad, I have authored books on two categories of our indigenous toys. One book is about the action-based folk toys and their makers. These are the toys traditionally made by artisans and craftspeople and sold at melas and fairs. The toys are very powerful in terms of their application of principles of science and are related to socio-cultural themes. This sector provides work to a vast number of skilled and semi-skilled artisans. There is a great scope for design development in this sector. Toymakers are also a valuable resource for schools to teach children a variety of toymaking techniques.

The other category of toys that I have documented is the innovative toys that children have been making all over the country for generations. This is a valued process of their growing up. Toy making is part of the early basic education that children gain from each other while playing. The making and playing with a variety of these toys also provide the useful context of learning by trial and error, and through experimentation. The toys made mostly use the recycled and discarded household materials; chits of paper, a leaf, an empty matchbox, rubber bands, a button, bottle caps, a piece of thread and so on. This provides monumental scope for making a variety of innovative playthings.

Today we talk of the importance of eco-friendly products and processes. We are also vocal about the need for users participation in product development. These attributes are part and parcel of the work involved in the making of indigenous toys and toymakers.

What is the future of this heritage?

Till now, we have not realised the importance of developing and utilising this resource. Several years ago, the Government of India had asked for a project report on setting up a national centre for toys. National Institute of Design (NID) was requested to carry out the survey and study. NID had given recommendations for a network of activity centres, and to bring together the designers, the artisans and the educationists in the process of development of new toys and learning aids based on our heritage.

Some work in this direction is being done at NID, by *Eklavya*, a voluntary organization in Madhya Pradesh and by individuals like Shri Arvind Gupta. But far more activities need to be initiated and sustained to do any justice to this type of work. For millions of children having fun while learning will be important investment.

The presentation at the Congress can be made. Some examples of Indigenous toys and toymakers cases would be included in the presentation.

Biodiversity

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In a megadiversity region like India, with the majority of its population directly dependent on nature for livelihood and survival, conservation and sustainable use of biological resources is of critical importance. These resources form the most significant inputs for the socio-economic well-being of our population.

Having been acutely conscious of this, local communities have developed practices and knowledge systems which are finely tuned to the rhythms and limits of their local surroundings. They have through the centuries made innovative use of biological diversity, finding myriad values in the plants and animals that lived amidst. Complex cultural and religious practices have incorporated these adaptations and innovations, as also provided the context for imposing various kinds of self-restraints in the use of resources.

However, not all traditional systems were so finely adapted, and most have begun to break down under the pressure of internal and external changes, including colonial rule, industrialisation, commercialisation, urban growth, and globalisation. Not only has the survival of local community systems been threatened, but the rights of these communities to their resources and knowledge have also been violated by outsiders. Any efforts at achieving biodiversity conservation will have to come to grips with these phenomena.

Within the broad framework given above, this paper attempts to focus on the following aspects, supported by examples and documented references from various parts of the country:

1. Local strategies and traditions of conservation;
2. Implications of traditional modes of resource use for biodiversity
3. The process of erosion and marginalisation of these traditions, are also their revival/protection in recent times;
4. Possible strategies for giving a central role to local community knowledge and practices in conservation of biodiversity and the sustainable use of biological resources, which will be based on:
 - * Participatory approach with local communities being at the centre of decision-making, planning, and implementation
 - * Integration of the two systems of knowledge/science/technologies: traditional and modern
 - * Opting for equitable and ecologically sustainable socio-economic and development policies.

Recent debates on issues of protected areas and people, access and intellectual property rights, common property resources, and similar topics, will be reviewed in dealing with the above aspects.

Bio-2 Traditional Forestry and Biodiversity in the Western Ghats

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Historical, social, ecological and landscape evidence from the Western Ghats of Uttara Kannada and nearby areas sheds light on aspects of traditional forestry and biodiversity conservation, their decline and revival in small pockets. The focus here also is on the potential for revival of community involvement in the management of biodiversity.

Ever since the agricultural occupation of Uttara Kannada, probably around 3500 years BC, people have been interacting with forests and changing the vegetation consciously. Millennia of shifting cultivation, created expanses of secondary forests; however, enmeshed in the landscape of agri-pastoral societies, were consciously protected sacred groves-cum-safety forests, ranging from one or two hectares to a few hundred hectares. Preserved in nearly pristine form through ages most of these groves remained intact till recent times and their remains are still at large almost in every village. It is some such forest patches in Uttara Kannada, which act as refugia for rare plants

of the region like *Dipterocarpus indicus*, *Myristica fatua* var. *magnifica*, *Vateria indica*, *Pinanga dicksoni* etc. Elsewhere in the Western Ghats too there occur remains of such groves. These safety forests were also linked to watershed protection, gathering of non-wood produce, and moderation of the local climate. The question of the people's awareness on the benefits of landscape heterogeneity may be disputed, but not the advantages which they enjoyed which made them adhere to traditional land use patterns with their *dos* and *donts* and consideration of the safety forests as the abodes of Gods.

The traditional people were aware of the virtues of secondary deciduous forest. It would be easier to slash and burn them to enhance soil fertility. They knew about the coppicing ability of trees and their greater powers of multiplication in the secondary forests. Manure, timber, bamboo, fiber plants and many food resources were associated with such secondary forests.

During state domination of forests, beginning with the British period, wholesale changes in natural vegetation were effected favouring one or few commercial species. Industrialisation, advances in agriculture, changes in religion and population pressures became major causes for decline of the people's perceptions towards biodiversity related issues.

Despite threats and overall decline, there continue to be instances of traditional forest conservation operating in a few pockets. A revival of the conservation practices is being witnessed in some of the villages. Moreover the ventures in joint forest management are taking root among traditional village societies although many hurdles are yet to be crossed.

Bio-3

A Miniature Sacred Grove near Vedanthangal

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Village and tribal communities have played a major role in conserving biodiversity. There are several small sacred groves in Tamil Nadu on hills and plains. These highly fragmented forest patches have provided a special niche for many rare and relict species that were once common in these areas. One such location occurs near the famous Vedanthangal bird sanctuary in the Passammur hillock. On top of the hillock there is an old keystone species of *Ficus mollis* Vahl, and a Diety *Ponni Amman* every year on the 18 th day of the Tamil month of Adi (July-Aug). But for these two factors and related traditions of the local community the Passamur hillcock would have been barren like the neighbouring hillocks. In an area just about the size of a basket-ball court, this hillock harbours no less than 110 flowering plants belonging to 40 different families. One of the most interesting plants is *Amorphophallus sylvaticus* (Roxb) Kunth. It is a rare aroid known as *Kattukarunai Kizhangu* in Tamil. It grows abundantly in the humus rich rock crevices. There are more than 1000 individuals concentrated in this area. The corms of this plant are used in Siddha medicinal preparations for the treatment of piles. They are also occasionally eaten. This rare aroid flowers in July-August. Soon after the production of *Jack-in-the-pulpit* like inflorescence, new leaves begin to emerge. Fruits are ready in August-September. Fortunately, the plant readily responds to all propagation methods-vegetative, through seeds and tissue culture. It can be reintroduced into new localities. It is also a handsome plant that can be grown as an indoor ornamental.

We have located very large protein bodies in the seeds of *A. sylvaticus*. This rare aroid has been successfully micro-propagated in our laboratory using trisected seeds. Each seed could generate 22 plantlets when cultured on MS medium with suitable hormone combination. Other plants worth mentioning are: *Kedrositis foetidissima* (Jacq.) Cogn, a rare cucurbit used in the treatment of cold and cough, *Strychnos potatorum* L.F. whose seeds possess clarifying properties as is well known to local people as *Thethan Kottai* in Tamil, and *Strychnos lenticellata* an uncommon climber whose roots are used as an antidote to snake-bites and stems are used for weaving baskets. Both species are related to the Strychnine-containing *S. nuxvomica*, another Siddha medicinal plant. The insectivorous *Drosera burmanii* Vahl is another important medicinal plant found in this locality. This plant is becoming rare in many of its this region. This species has previously been collected only from one other site in the district. The *Ficus* tree that supports this assemblage of plants is probably 100-200 years old. The leaves of this plant provides the humus-high substratum as well as the shade required for *A. sylvaticus*. It is indeed a wonder that the aroid and other plants have survived on this small hillock for this long. We did notice young boys often uprooting the plant and throwing them around. Occasionally the sheperds cut the leaves to feed the goats. The plants of this hillock will survive long, along with Vedanthangal lake, if human pressure for land does not increase in this locality.

Bio-4

Resource Management Strategies in Rural Assam: Implications for the Conservation of Biodiversity

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Having rural economy based on agriculture, a wide variety of resource management activities tends to characterize the economic life of the rural population in Assam. Majority of the farmers in Assam have access to several different agricultural sites in and outside their villages. The environmental diversity is one factor that has led to the development of a large number of different production systems. Among the production types used are the cropping of rice, mustard, jute, vegetables, etc. on

annually flooded mud-flats and beaches, the growing of grains, vegetables and other plants on relatively fertile natural leaves, and the management of diverse pre-existing fallows or forests and complex agroforestry fields on areas in uplands where the villages are actually located.

During 1987-1995, as a part of an ethnobotanical investigation and inquiry into resource use pattern among the rural population in Assam, an intensive study on resource management strategies was conducted. The present

communication summarizes some of the findings, focusing particularly on diversity of plant species found on different production systems prevalent in rural Assam, their variability and composition. The process by which these production systems have been evolved and changes are also outlined.

The findings of the present study indicate that the rural population of Assam are the inheritors and developers of rich traditions of plants and ecosystem management. Many of the species that are kept in different production sites are also found in

nearby forests and can be collected from there. But traditionally managed production sites have been considered as convenient places to raise lands that are frequently used, or are delicate and require protection, or valuable, or particularly pleasing to have close to the villages. Another important aspect is that these production sites also provide suitable habitats for large number of wild animals. Protection of pre-existing fallows or forests is usually associated with some supernatural powers.

Bio-5

Korkus of Melghat

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The Korkus of Melghat are a forest dwelling tribe, of the Munda speaking group. They are also known as the *Potharia Korkus*. Stephen Fuchs states that they inhabit by preference the hilly forested areas of Melghat. Though they may appear to be culturally backward and devoid of material possessions, they lead a more contended life and appear to be more healthy.

The Korkus were shifting cultivators in the earlier days when the forest department was not organized as at present. The shifting cultivation (Dahiya) required well wooded slopes, plenty of rainfall, and primary forest with timber trees. Dahiya plots thus selected were clear felled and the vegetation left to dry in the sun. The dry wood and branches were set on fire in the month of May. The burnt ash formed a good fertiliser for the hill millets which the Korkus sowed. They cut down a ring of trees around the clearing, which interlaced and formed a fencing. It was further strengthened by being plugged in by thorn bushes and shrubs. As the cultivated crops attracted smaller mammals like hare, and birds like pea fowl they set up traps to capture them. When the clearings were abandoned, the secondary growth took over, however these areas were not preferred by them as they would not contain good timber species to give plenty of ash when burnt. The repeated use of new forest areas affected the primary ecosystem, therefore, when the forest department came into being, the Korkus were persuaded to give up shifting cultivation. Permanent plots of land were given to them and they were also employed in forest working.

Presently the Korkus are cultivating their small individual plots, and supplementing their food sources with fishing and

NTFP collection. Both the latter activities are on traditional lines. The methods employed for fishing shows that they have a good knowledge of the habitat, species and the temporal variations. A few individuals have resorted to unsustainable methods like dynamiting, which is resented by the majority. The knowledge the Korkus have of the honeybees and the flowering species of the forest has been documented by the forest authorities. The paper contains an annexure prepared by the forest department which gives the names of the species and the use to which it is put. Ethnobotanical studies on the Korkus are continuing, so the list may not be complete, besides the Bhagats and the Bhoomkas who practice herbal medicine among the tribals keep such knowledge a secret and it may take a long time to record complete information.

The Korkus of Melghat are allowed to continue with their fishing and forest collections by the forest department presently, though there is no official sanction. Their amazing knowledge of the biodiversity of the region has been acknowledged by the forest department, and efforts are on way to record the same. Fishing by the local tribals and other villagers has become an acrimonious issue between the forest department and the villagers in the neighbouring Pench NP. The reason seems to be because of the commercial exploitation of the resource. If such market forces take over in Melghat the relationship between the forest department and the Korkus may take a negative turn.

Bio-6

The Importance of Traditions and Traditional Knowledge in the Preservation of Bio-diversity

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The foot hill region of UP is acknowledged as one of the richest regions of Bio-diversity. There, the local people have certain concrete traditions-which is there for centuries-which help in preserving nature!!

In recent times, when the environment too are conjoins about the problem of preserving nature-the rich natural processes of this region has still been adversely affected.

In order to preserve the bio-diversity of a region-traditional norms and local knowledge regarding them should be encouraged and local people participation should be recognised not

only in the Himalayas, but in area of Bio-diversity-any where in the world. The local knowledge should be used. It is necessary to understand this.

Bio-7

Indigenous Health Traditions and Biodiversity

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Community rooted health traditions in our various eco-systems utilise the largest proportion of plant diversity that is available in an eco-system. Plants used for health care are 20-50 times more than those used for food, fuel, flora, fodder, etc.

Another interesting fact is that in the health field we can still see *living traditions*, amongst our so called eco-system people. All living traditions must be intrinsically & evidently dynamic; that is the only way to distinguish them from non-living traditions. They must therefore display both continuity and adaptive change across time & space. They also possess their own.

From the above two facts one can draw interesting insights into the relationship of indigenous health traditions and bio-diversity as well as into the sociological nature of the health traditions themselves. The social nature of the health traditions appears to suggest that since they display both continuity and change they embody the essence of modernity. It then seems fallacious to term the health systems of local communities as traditional as opposed to the so called modern medical traditions as if *modern* was exclusively universal and the only changing and evolving phenomenon. It seems more appropriate to use categories like indigenous traditions of health and western health traditions in order to distinguish between two in terms of both form and content. Across cultures it is natural to expect variation just as it exists across eco-systems.

Bio-8

Beyond the Biodiversity Convention: Need for India to also Pursue a Village Oriented Agenda in the Interest of the Eco-system People

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There is a movement building up in the country to prepare village registers called CRs (Community Registers) on the traditional knowledge of Bio-resources known to village communities. The purposes of this documentation are the following:

1. Revitalisation of local knowledge
2. Developing guidelines for access of local communities to bio-resources
3. Developing guidelines for conservation priorities of bio-resources and
4. Protection of local knowledge and resources from piracy.

The CR documentation could serve as a preliminary basis for revitalisation of local knowledge by enabling agencies to:

- a. Recognise the range of local knowledge
- b. Reward outstanding traditional knowledge/skills/and conservation practices
- c. Confirm and promote sound local traditions in various fields

- d. Promote inter-community transfer of knowledge for capacity enhancement

It is, however, clear that a revitalisation program cannot end with mere baseline documentation of local knowledge but would need to undertake several other creative and practical steps for conserving both biodiversity and cultural diversity.

The Ministry of Health and Forests, Government of India, is also examining how the village level community register can be used as an instrument to protect traditional knowledge of bio-resources. It is currently engaged in formulating a comprehensive legislation on biodiversity within the context of which this register could be used. We expect that under the new legislation material transfer agreements will need to be entered into for commercial use of all Indian genetic materials. Access shall be provided only to organisations from countries which have changed their IPR laws to incorporate provisions for identifying (a) source of the traditional knowledge based on which a new application or modified products has been designed and (b) evidence that informed consent and due compensation and fees has been paid for use of biological material and or the traditional knowledge about the Bio material.

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In order to sustain industrial production that is based on forest materials, especially of seeds and medicine, large areas covered with forest are circumscribed, as reserves of biodiversity in nature. It is being realised today that the scientific method and institutional infrastructure required for its practice are inadequate to explore this reserve. There is a crisis: these reserves are of little value, if what is in them is not accessible for study

It has been pointed out that:

the knowledge about the world's life forms lags surprisingly behind other fields of scientific enquiry, a great deal is known about individual species of birds, fishes, mammals and plants, fewer than 1.4 million of the world's 5-30 million species have been named, let alone studied in detail. Knowledge about the functioning of ecosystems is just as scant.

Information is limited on the conditions and value of biological resources, as well as uses and management techniques employed by traditional cultures over centuries (World Resources 1992-93: 134)

From the standpoint of medicinal plants

it is estimated that 2,65,000 flowering species grace the earth, of these less than one percent have been studied exhaustively for their chemical composition and medicinal value. In a world with limited financial resources, it is impossible to screen each of the remaining species for biological activity. Some collection strategy is needed (Cox and Balick 1994:61).

In this context traditions relating to nature other than the modern scientific tradition have become important. The forest dweller's tradition is one such tradition that is being trapped for information on biodiversity. For instance,

Residents of a forest village in Thailand eat 295 different species and use another 119 for medicine. The World Health Organisation estimates that 3000 plant species are used for birth control by tribal people around the world. This knowledge is rapidly disappearing along with the indigenous tribes that possess it. Compounding the problem is the lack of trained scientists and engineers in many of the developing countries where biodiversity loss is the most severe (World Resource 1992-93:135).

This search for knowledge about forest materials is based on the observation that the use of plants can offer strong clues to

their biological activity.

In another enquiry it was found that crude extracts of a plant that one healer considered important gave rise to four times as many positive results in a preliminary laboratory test for activity against HIV..

Researchers have found that 86% of the plants used by Samoan healers display biological activity... (Cox and Balick 1992:62).

The emphasis on *collection strategies* raises a question of method: how is the forest dwellers knowledge generated without the modern scientific apparatus, its conceptual categories, propositions, logical relations and the instruments of experimentation? The observation that *knowledge about the world's life forms lags surprisingly behind other fields of scientific inquiry* indicated that the method of this inquiry is inappropriately equipped to explore and discover the biodiversity enclosed in the universe of the forest.

This question of method of inquiry underlies the crisis of biodiversity. What is there in the tradition of forest dwellers which is lacking in the tradition of modern science, on account of which forest dwellers know the special medicinal qualities of plants? Modern science is unable to generate, such knowledge, it is able to *collect and confirm in the laboratory* forest dwellers knowledge which was generated without it. This inquiry is urgent: the processes of modernisation that accompany the scientific method create conditions in which forest dwellers gradually lose their knowledge. In this situation there is every likelihood that there will be little knowledge about the forest materials protected in these reserves of nature.

This enquiry begins by distinguishing the forest dwellers' access to the universe of the forest from its accessibility through the modern scientific method: the former mode is labour intensive and the latter mode is capital intensive. These differences constitute different views of this universe. From them flow different perceptions of the multiplicity and abundance of biodiversity. The question of method is: how is universe accessible through the labour intensive mode?

In my presentation, an attempt is made to understand a view of the universe of the forest when it is accessible as a living space: a home and a place of work. It is based on what Koitors of Abujhmarh Bastar taught me when I stayed with them between 1982 and 1987.

Four Sacred Groves of Nedumandad, Kerala -

A case study

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Sacred groves have existed in India from time immemorial as patches of densely wooded areas, set aside on religious grounds. They have preserved rare and endemic wild plant species, many of which may benefit medicine, agriculture and industry as a source of natural products for drugs, food, fuel, fibre, industrial basic compounds etc.

The present study pertains to four sacred groves of Nedumandad Taluk of Thiruvananthapuram district, with reference to their biotic and abiotic components, their productivity potential, and the environmental factors which affect them within an ecosystem framework.

Our studies of the biotic components include a floristic analysis of the groves (trees, shrubs, lianas, herbaceous, undergrowth including macrofungi), components of the associated waterbodies/paddy fields (producers), microflora of the soil and litter (microconsumers or decomposers), and the fauna (consumers). Abiotic analysis includes data on atmosphere collected from the meteorological station, Thiruvananthapuram, and different chemical and physical characteristics of the soil using standard techniques (Misra 1968).

Interestingly the area covered by the four groves under study vary from 1 cent to 1 hectare (Nagaru Kavu 1 cent, Valiaveetil Kavu 25 cents, Manthuruthu Kavu 1 acre and Indalayappan Kavu 1 hectare). Field productivity studies form a major aspect of our work. Only above ground biomass is measured. Biomass of the herbaceous vegetation is measured by replicate samples harvested randomly with a quadrat grid (1/2 m²). Productivity

studies of arborescent members were done using dimension analysis, where satisfactory predictability of standing crop can be obtained from basal diameter multiplied by height (Barbour et al 1980). Litter is the food source for decomposers and detritivores and it is the means by which nutrients are returned to the cycling pool. Amount of litter collected was measured keeping litter traps in different places of the community and taking the average dry weight. Net Above-ground Primary Production (NAPP) was also calculated using a formula described in the paper. Our data are pre-monsoon and post-monsoon measurements.

Our studies show that the four sacred groves are fragmented portions of a vast stretch of land representing a forest site on habitat. All the four groves enjoy the same climate; they are also topographically same. On a broad basis soil factors are also similar but we find that there are some differences in the floristic composition, which naturally reflects in differences in NAPP. Hence it appears that these four sacred groves represent parts of a continuum and a tropical forest, separated from each other in the remote past due to natural calamities and seasonal and historical factors like drought, fire, tornado etc. In the recent past human interference has resulted in partial destruction of the vegetation, making the groves smaller. This interference might have been in the form of overgrazing by cattle, cultivation of plantations, and construction of buildings. Still, the essence of the groves is retained and conserved, possibly due to the religious fervour attached to these sacred groves.

The Socio-Religious Dimension of Sacred Groves: A Comparative Study of the Irula and Aiyannar of Dharmapuri District

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Sacred groves are seen in many parts of India. A sacred grove is a patch of forest land which is considered as the abode of a deity, and is kept totally undisturbed and free of all exploitation. Many scholars believe that the sacred groves have their origin in the hunting-gathering stage of the society, and it is also being speculated that they provided suitable setting for cult rites. The deities which are associated with the groves are characterized as *ferocious* in nature and merciless in punishing the offenders. Sometimes a sacred grove may shelter more than one deity. The sacred grove is rich in biological and genetic diversity. Like their biological diversity, the religious beliefs associated with various sacred groves are also varied. In the

present day context, due to the exposure of the sacred groves to the outside communities, changes in the belief system of the community which has the institution, and the mindless forest exploitation, sacred groves are being disturbed and in some cases even destroyed beyond the reversible limits.

Keeping this as the backdrop, the paper makes an attempt to understand the sacred groves within the contexts of socio-cultural and the physical environments of the Irula, a tribe which primarily practices foraging economy, and the Aiyannar, an agricultural caste inhabiting the village located close to the forest borders.

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Saduragiri hills in Madurai district is an example of tragic deterioration in tribal culture and resources by commercial forces by unfair capitalization of tribal knowledge of biodiversity. The caution in and limitations of approaching and documenting the peoples biodiversity knowledge in a tight rope

equilibrium is the key issue. Quantification of real value of biodiversity produce is mind-boggling and shaky nature of several so-called sustainable prescriptions provide a gloomy picture.

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Neggu Panchayat in Uttara Kannada district harbours a matrix of several human communities nestled in a mosaic of habitats. Only a logical sampling has enabled documenting information under the challenging variety of people and nature. Retracing

the history of people and biodiversity is an important tool and couple with current trends can be used for future speculations as also natural resource management. The scene here is one of hope.

Navigation

Tradition to Science through craft skills: A case study of Navigation Path Finders!

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Anecdotes of rich cumulative experiences of navigating sailing vessels without the aid of instrumentation, and transmission of the navigation craft wisdom by word of mouth through generations of heredity much before rendering in written words are aplenty among the seafaring communities spread all along the Indian coasts. The present paper pieces together such packages of navigational wisdom and skills, unique to the seafarers of the Indian Ocean, in particular with reference to the seamen traditions of celestial navigation and steering with the help of stars to find their way through directionless waters to safe havens.

Based on extensive field enquiries among the seafaring tandels of traditional sailing crafts, their oral traditions and living practices and written manuscripts of guidance in local seamen dialects, drawn from different sections of the Indian coasts, this study probes the knowledge package of seamen to understand and appreciate the modus operandi in the deployment of star

wisdom for practical navigation. The paper seeks to explain how keen observation of the skies in different seasons under different weather conditions over centuries has resulted in identity-conscious star nomenclature, use of dawn and dusk stars for evolving a highly reliable azimuthal star compass for directions, use of transit stars for location fix of ports, islands and coastal stretches, development of a resection technique through simultaneous observation of known stars to fix open sea position of the vessel and generation of practically useful *parallel sailing* and *rhumb line sailing methodologies for safe navigation*.

The last part of the paper explains the scientific principles underlying the use of star wisdom for navigation and brings out the effectiveness of tradition and custom based thumb rules of celestial navigation, anticipating the scientific laws formulated in later days. The paper is illustrated with explanatory transparencies.

Popular General Lecture Folk Traditions in Sailing Vessel Navigation

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India has a rich maritime heritage dating back to the beginning of the Christian era. The Indian mercantile community had trade and cultural relations across the seas with people of S.E. and East Asia, as well as with people of Arab and African countries, Greece and Rome! This maritime heritage is firmly founded on the heredity-transmitted oral traditions and learning by living practices over generations. Written traditions in local seamen dialects is relatively recent. Much of these traditions are embedded in boat songs of a technical character, anecdotes, ballads and observation lessons on board by young aspirants of the sea and sky environments. The cumulative experiences and wisdom gained through long periods of active practice have been zealously guarded in secrecy within the limited family and community circles; they have at best trickles in bits of information to the land-oriented caste elites and have hence not found a place in classical literature. Thereby hangs the saga of sea-voyages that have developed a romantic, heroic aura around them and an unfounded fear of the sea leading to taboos of sea-voyage.

The present discussion draws upon the rich field experiences over a period of a decade gained through interaction, discussions and participation in the sea-experiences of traditional sailing vessel tandels and pilots. Their living practices, modes of perception of the seas and skies around, oral traditions, thumb rules arising out of such traditions, superstitions and astrological prescriptions, sea-lore, and written down manuscripts of sea manuals form the basis of this presentation. The discussion is confined mainly to navigational skills and practices, though rich traditions abound in boat architecture as well. Special reference is made to wind lore, wind and star based direction compasses, wisdom of the currents, tides and waves, sea-life and under water topography, navigational hazards, knowledge of rough seas and foul weather, location fix in open sea, navigational landmarks, sea charting and layout of voyage routes in relation to season. Examples are drawn from different sections of the Indian coasts, more specifically the Tamil coast.

The presentation is illustrated with transparencies.

Dipti Mukherji & Tapati Mukhopadhyay

Navigational heritage of mediaeval Bengal is not well supported by authentic documentation. However, Bengali folk literature like the Mangalkabyas in general and Manasamangal and Chandimangal in particular written between 1450 and 1757 A.D. contain many references on the navigational heritage of Bengal.

Based on these specific Mangalkabayas, the present paper attempts to integrate in a cohesive manner, the various facets of the navigational heritage of mediaeval Bengal. The paper, thus pieces together the traditions of navigation of river and sea-going vessels in Bengal, the waterways of the period, the

navigational practices and routes followed in both inland waterways and sea voyages, the ports visited, commodity flow and the socio-cultural background in which boat ethnology and navigational skills flourished, as depicted in two Mangalkabyas. Reference is also made dangers to navigation, and the seafarer's customs.

An attempt is made to examine the relevance of the old navigational routes of Bengali boatmen in the context of the changes in the waterways in lower Bengal in a spatio-temporal frame.

Traditional wood processing for fishing crafts

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The common fishing crafts used are traditional 3, 4, 5 log Kattumarams (Catamarans), dug out canoes and plank built canoes or Vallam.

When large light weight tree trunks were available, dug out canoes were used in large numbers. For the construction of vallam small flat planks are used. The planks are tied together with thick fibres taken from the palmyrah leaves.

Kattumaram is the no problem craft with ideal beach landing and excellent surf riding capabilities. It is unsinkable also.

Varieties of wood used

Ideal timber for kaattumaram should be light and buoyant dimensionally stable, durable, easily available and reasonably priced. It should not drink water. Any known timber log of the present day, never satisfies all these conditions. For time immemorial, *Albizia sp.* and *Melia dubia* are extensively used in the west coast for the kattumarams. They are brought from Sri Lanka also. Trees such as *Erythrina*, *Bombax insignias*, *B.malabaricum*, *Anthocaphalus cadamba* and *Sterculia* are tried and used since these have some acceptable qualities. In Tuticorin area wooden planks of *Acacia* are also used since the planks are sturdy and no penetration of water takes place.

Traditional ways of Processing; of timber

Constant exposure to the scorching sun, the hot sea sand, and desiccating winds damage the timber. Alternate wetting and drying causes surface splits, cracks and dimensional changes on the logs. Wood rotting fungi also soften the wood and make the wood to take in a lot of water. This reduces the strength of timber. Fouling and wood boring marine organisms also de-

stroy the logs.

The fishermen of the past had a very good way of treating the native timber or timber to construct good kattumarams. (1) They soak the logs of proper size in sea water. This helps in the removal of sap and latex. (2) They bury the logs in wet sea in the beaches for seasoning the wood. (3) The logs are piled on the sea shore in shade (4) The logs are then shaped for proper alignment of timber in the kattumaram. (5) Sardine oil is used in painting the timber to protect it from damage in sea water. Turtle Fat is collected and after melting, it is smeared on the outer surface of the logs to prevent the attachment of foulings & boring organisms to their crafts.

Modern Methods

A water borne chemical preservative, copper-chrome-arsenic compound and oil borne preservative like creosote (a coal tar distillate) are used nowadays to protect and preserve the wood used for kattumarams. The effect of chemical treatment depends on the extent to which the preservatives penetrate the timber. Moreover oil borne creosote increases the weight of timber, discolour the timber and the combustibility of wood also. Physical protection such as Fibre Reinforced Plastic (FRP) sheathing can protect the wood by preventing it in coming into contact with sea water.

Even with the modern technologies, nowhere has anybody ever successfully substituted the kattumaram and also the traditional ways of processing the timber. These traditional kattumarams are facing a serious problem since suitable timber is not available.

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As a part of a survey-cum-documentation project on *Traditional maritime activity in the subcontinent - art, craft, techniques and materials*, we have tried to trace the indigenous traditions of boat-building along the entire coastline of India, including Lakshadweep and Andaman & Nicobar islands, and also Sri Lanka. The design, materials, style and boat construction methods were developed indigenously at different places according to the hinterland, availability of raw materials, local physical oceanographic features and the purpose for which boats were built. Most traditions and techniques were passed from generation to generation orally and by observation and training.

In the present paper, the different caulking techniques as well as materials and mixtures employed for waterproofing of boats through generations are described. On Gujarat coast, the emphasis has been on meticulous caulking techniques based on groundnut oil and a resinous material (chandrus). Use of quality teak wood and special Vadhrai joints are other features of boats. Muslim communities used shark liver oil (Sifa) for coating of boats. Use of locally available Undi oil in caulking and coating mixes characterizes the Maharashtra and Kar-

nataka coast traditions. Use of cotton wigs is more common on most of the West coast. Use of shark liver oil and sardine oil is more common on the Malabar coast while tar is employed for coating by poorer fisherfolk, especially for small fishing boats and for coating of dug-out canoes.

Special design for stability and black appearances due to the use of tar in coating mixes mark out the Tuticorin tonis. Stitched boats and avoidance of use of nails, along with waterproofing with oil-resin caulking and coating mixes are found at several places. Use of fish oil-based mixes is prevalent on islands and in Sri Lanka. Local variations in caulking practices and materials on Andhra, Orissa, and Bengal coasts will be presented in the paper.

Development of special joints and appropriate caulking formulations and application methods, especially for ocean-going large (150 to 400 tons) wooden ships; periodic renewal of coating (chopad) for better maintenance of boats; repair work and re-caulking; measures for reducing the attack by borers and growth of barnacles; and other details will be described.

**Markets,
Resources &
Policy Issues**

Role of Local Markets in Traditional Technologies (Background Paper)

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Today we are increasingly hearing about the world becoming a global village. This expression may indicate not only emerging identity of interests among upper sections of all societies across the world but even a nostalgia for village as a community. However, global village can only spell further marginalisation for the artisans and small producers continuing to live in lakhs of villages and towns of this country. Global village means expansion of the sources and sinks encompassing the whole globe cutting across national boundaries for the benefit of the modern industrial world to mine for its requirements and dump its refuse.

Local markets for local produce takes us towards an agenda for empowering these artisans and small producers and making it possible for them to derive a dignified living with use of the best resource that they have at their command, viz. their traditional technologies. This takes us towards autonomy for the vast number of producers of the country. The question of local market for local produce is intimately linked to the idea of *swadeshi* and its philosophy as we have understood from Mahatma Gandhi.

The Context

We have been led to believe that India is and has been an agricultural country. There is no doubt some truth in it. But then a large section of population was also engaged in non-agricultural profession. Industrial activity was considerable. The produce from such industrial activity found ready use (market in today's usage) in the surrounding areas (villages, towns). As a consequence living standards of the agricultural and artisan classes were not very dissimilar. However the path of development that we set for ourselves has resulted in neglect of this vast pool of indigenous technological resources.

The contemporary position is that today from towns of various sizes down to villages, we find that market is full of goods produced in production centres located far off from these places of their consumption. Often such production takes place in large scale production units using technology that has originated and developed elsewhere under certain specific circumstances of its own. This itself can not be adequate reason for opposing such technologies. The test of their suitability lies in their impact on largest sections of our people particularly the producing classes, including artisans and other small producers. The technological capabilities of the artisan and other small producers classes can not find productive avenues, when they do not find a prominent place in the local market. Today from agricultural implements, to articles of daily consumption and use like soaps, utensils, baskets, oil, cloth etc. to building materials all come from far off production units. The consump-

tion of goods produced by the local producers-be they pottery, metal, wood, cotton, stone, bamboo or any other agricultural produce based goods-is dwindling day by day.

Consequences

The consequences are inevitable. The large production centres based on western technologies are not able to employ these indigenous technological resources. And even when they are employed in production of goods in such technologies, they do not find any respectable place in such production. The skilled technologists thus become *unskilled* labourers. This process of de-skilling is drain of technological resources in itself. However, the consequences for the artisan and other small producing classes are serious. They are losing work and forced to join ranks of unemployed or under-employed.

This situation has implication particularly for the work that women producers are capable of accomplishing at the household level but which now finds negligible markets. Particularly the village women have always been involved in various production activities that can be taken up at home without going out to centralized production centres. These include, *inter alia*, seed preparation, stitching, spinning, knitting, food processing and other host of other household based industrial activities. They have significantly contributed to production of cloth. The drying up of market for the local produce very adversely affects them because they are first to lose these sources of livelihood. The modern sector is able to provide productive avenues for only a handful of highly educated women of today.

The present situation also has serious consequences for egalitarian concerns of society. Large scale production also generates large scale inequalities. The valuation of labour is fragmented. The less one works with hands the more valued the labour becomes (e.g. the labour productivity goes up with greater automation). On the other hand the local producers don't even get a just value for their labour.

There are many other cultural and other consequences as well. For example, the loss of local market for local produce (and its dominance by the large scale production) points to fierce competitiveness at the cost of values of mutual dependence and a sense of brotherhood. Rootedness of production also fosters rootedness of the people and the values.

The Issues

The major issue then is seen as availability of local market for local produce. There is a need to understand how the local market has been eroded over the years. Is it because the new technology was inherently superior to the traditional in-

digenous small scale technology? Or are the non-technological factors at play? What has been role of public policy? How have traditional rights over natural resources changed? How has public policy influenced access to raw materials? What is role of credit policy? There is the question of implicit subsidies that different production processes enjoy. There are huge subsidies in the form of training establishments, public education, health, transport, power and many other such area. Such implicit subsidy is overwhelmingly enjoyed by the modern sector. Without considerations of this subsidy in the production process, no true economic assessment of different technology regimes are possible. Then there is also question of sustainability of different technological processes in production.

These are only some of the important questions. A number of questions are raised whenever these issues are discussed with the artisans themselves. For example, when sources of raw materials are located non-locally (e.g. yarn from big factories) then it may not be possible

to talk of local market for the final produce (e.g. handloom textiles in this instance). Even if we suppose that production in large production units is an important way for achieving prosperity of the society, it still remains to be seen how a reasonably equitable distribution of goods thus produced can be achieved. A mass of regulatory apparatus becomes necessary as noted by Mahatma Gandhi 51 years ago to date (Harijan, 2 November 1934). In the same issue Mahatma Gandhi also points out, *[w]hen production and consumption both become localized, the temptation to speed up production, indefinitely and at any price, disappears. All endless difficulties and problem that our present-day economic system presents, too, would then come to and end.* Most of these questions and issues raised are difficult questions. A lot of work is required to understand these issues. The work is required both in the field and at a theoretical level. However, any good understanding can not be developed without involving the artisan and the small producer classes themselves.

Mrp-2 **Bamboo Products: Local Marketing in Transition** **A Study in Kamana Artisan Node**

Vinoo Kaley

Village Kamana Mandal Wankidi, Dist. Adilabad (A.P.)

Local Marketing has always accounted for the bulk of the artisan produce in tradition. A sufficiently diversified artisanal production mode was kept, with the buyer side to keep a fair control over the economic matters. This paper studies the transition of Local Marketing of Kamana Artisan Node at Adilabad (AP). The paper limits itself to the bamboo artisans only.

A village of some 400 households, sub-clustered in 3 *Gudas* (sub-villages), Kamana lies 2 km off the nearest tar road. Although a big village and priding on a sizable artisan population comprising of about 10 different artisanal occupations, Kamana itself does not host a weekly market. The biggest weekly event in the Thursday Market (*Angdi*) at Wankidi which is a much smaller village.

It is rather a deep tragedy that there is scarcely any documentation of important historical events at district or sub-district levels. The British efforts at Gazetteers falls far short of our needs for understanding the flow of these events. There is no clue to the steep decline in the status of this once prosperous town, which was reduced to a small and undiversified (all farmers) population, just before the *Mandal* hood came to be conferred upon it.

It may be said that there is a perceptible shift towards non-local markets. But unlike the case of textiles, leather and to a certain extent pottery, the situation of bamboo worker is much better. Without having gone into the statistical data collection and analysis, one may say that only around 60% of the bamboo artisan produce is used by the population. It is the remaining 40% export of produce which keeps the Kamana artisans from actual starvation.

But the need is to increase their incomes above the present penury levels, bringing more buying power from the same hours of work. For this they need to have a much richer product mix and a strong and continuous design input into their products besides a community organization to guard the community's interests on both the raw stock purchases as well as the finished products.

And to conclude, one must make it clear that Local Marketing cannot work for any one craft. Hopefully these aspects would be covered in the other themes.

Navjyoti Singh

NISTADS, New Delhi

Indian state is at a cross road of three structural adjustment programmes stemming out of three-fold limits to state's role in rejuvenating potentials of our people. The three structural adjustment programmes are (1) Liberalisation drive addressing our clogged economy, (2) Panchayati Raj drive addressing our non-participatory polity, and (3) Mandal drive addressing our socio-cultural sickness. Current substance of these drives is far from satisfactory and in essence counter-productive. Revitalising TST resource base has a determine role to play and can give new fulfilling meaning to these structural adjustment drives. *TST Agenda is an agenda for Internal Liberalisation, it is an agenda for Local Initiative, it is an agenda for Cultural Uprightness.* There is a need to pronounce substance of these agendas.

By and large TST practitioners belong to backward and scheduled communities. Direct strategy to undo outcasting has been caste empowerment which sadly has been limited to reservation in education and government jobs. Major national move for cultural uprightness will be caste empowerment in terms of rejuvenating traditional professional aspect of backward and scheduled communities. Empowering TST professionals is an explicitly economic move that contributes directly to regenerative value addition in society. Discourse of backward and scheduled caste empowerment should shift away from reservation in white collar professions to revitalisation of their traditional professions as an active economic drive. Strategies like reservation should be applied to raw material availability, credit availability, fiscal protection etc. and to political share. Caste empowerment limited to social welfare measures is not self sustaining, what can be self sustaining is empowerment in terms of economic drive that reclaims vast reservoir of traditional scientific and technological capacities.

What needs to be promoted is a vision of India as *amosaic of modern villages*. It is in giving substance to this vision that central role will be played by TST revitalisation agenda which can help unleash local initiatives. Today village is technologically destituted. Communities which are bearers of traditional technologies and sciences have suffered in the two century old

process of neglect. Though even today local S&T capabilities that are available or that can be easily reclaimed are traditional skill and knowledge capabilities. It is only by involving them as professionals, as traditionally cultured professionals, that *grama sabha* level plan of reconstruction and modernisation is possible. *Panchayata Raj drive should be broadened to engrain politico-technical empowerment of TST professionals.* And this should be done not merely for natural resource management but also for manufacture as well as service sector.

Most radical element of TST agenda is undoing of economic outcasting of TST practices. There is a need to strive for and establish level playing ground. Traditional S&T practices work under tight regulatory regimes of contractor/inspector raj, they work under adverse subsidy structure, they work under monopoly credit structures, they work under disappearing local market segments, they work under adverse pricing and taxation regime. Current liberalisation drive only addresses problems of liberalising markets with international segments and at best markets with international segments and at best markets with national segments. Manufacture related to these segments can only benefit which do not really involve participation of large mass of our people and their skills. Our economic agenda on the other hand should relate to encouraging manufacture and production for local segment markets to which TST production processes cater. This involves internal liberalisation of the economy.

Policy perspective for TST agenda will develop force only if they are furthered by organisational force. What are and could be the forms of organised impetus to the TST Agenda is an issue that needs to be discussed and debated. Clearly it can not be just pursuation of people manning the state, it has to be the organisational forms of the practitioners of TST. Current socio-economic significance of TST resource base in our statecraft and polity can be brought out only by the signs of organised demand from TST practitioners. What is called for is review and celebration of positive movements towards promotion of TST resource base in (1) Trade Unions, (2) in Caste Associations, (3) in Socio-technical moves, (4) in Protest movements, (5) in Philanthropic moves, (6) in Cultural drives etc.

Policy Implications of Revitalising Traditional Sciences and Technology

Navjoyti Singh

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Introduction

First Congress of Traditional Sciences and Technologies (TST) at Bombay IIT brought out contemporary significance

of the living traditions of science and technology for societal reconstruction. We as people, as civilisation and as nation are richly endowed with wide range of S & T capacities inherited from traditions. Unfortunately, in the hasty march of modern

India, these capacities have been outcasted. These capacities are our assets and need to be harnessed for participatory reconstruction of our society. Such a need today is shared widely and has strong implications for statecraft as well as societal, economic and cultural movements in the society. *Any agenda for prosperous future of India must build on our TST Resources.*

In the First Congress, however, the task of revitalisation of TST was not an object of direct attention. Second Congress is an apt occasion for dwelling on the theme of policy issues related to TST, plans and strategies of revitalising TST and wider implications of such an endeavor. *Scope of this theme is not merely to reflect on policies adopted by the state and suggest policies that need to be adopted by the state but also policy implications of TST Agenda for various relevant movements in the country.* Idea is to make available platform of the Congress for expressions, reflections and negotiations, either current or projected, on policy issues.

Our resource base of TST is today in the state of internal disarray and is saddled with attendant sense of the loss of voice. We are witnessing today large scale deskilling of our TST resource base. The TST practitioners have been by and large outcasted, marginalised and pauperised in the march of India. They are losing control over their means of production. Inventory of materials required to practice TST has dried down. Local market support of TST products has shrunk. Traditional patronage structures have that sustained excellence have disappeared. Traditional peer structures operative in various disciplines of TST have decayed. Propagation, up-gradation and buoyancy in the traditional skills, techniques and knowledge has not occurred in the new situation of mass market and centralised polity. *Revitalisation agenda for TST today is a difficult one and is clearly not limited to action by the state.*

Much of the problems faced by living TST practices can be perceived as resulting from the absence of positive policy or pursuance of wrong policies by the state. This gives rise to hope is a reformist hope can only be sustained through or would only be meaningful if *organised assertion of the voice of TST practitioners is possible through various social, economic, cultural and political movements.*

There has to be loud organised assertion from all possible corners that *TST sector is a productive force which has been outcasted* in the march of India. This outcasting is a modern politico-economic phenomenon and is fundamentally responsible for mal-modernisation and mal-industrialisation of our society. *Reclamation of this productive force can revitalise our economy, can give way to participative polity, can lead to surge in socio-cultural pride. TST Agenda is to undo outcasting of TST productive force for reconstruction of our economy, culture and polity.* The Plenary session of the Policy Theme in the second Congress will be on thus projected TST Agenda.

Policy concerns directly related to statecraft have been grouped into three sections of the Policy Theme in the Congress:

Production Process Related Issues of TST

Issues related to material inventory for TST practices form one of the most pressing concerns today. Problem of non availability of appropriate raw materials is a most pressing problem being faced by the practitioners of TST in virtually all the branches. Contractor Raj and auctioning mechanisms currently operative on TST inventory materials need to be drastically changed in favour of traditional haqdari system (or its near equivalent modern occupational rights ensuring mechanism). Material problems faced by various branches of TST needs to be highlighted and suggestions invited. TST community associations have also formulated such demands in some of their statements and suggestions.

Issues related to rationalisation of surplus extraction in TST related production consumption cycle (trade-packaging-primary manufacture-raw material). Exploitation of TST practitioners in the hands of modern packagers and traders has become a widespread norm. Surplus distribution is highly skewed in favour of modern packagers and traders. Legal framework of manufacture and trademark regime etc. needs to be examined to introduce instruments for protecting interests of primary manufacturers. Instruments such as *certification of primary manufacture* should be tagged to the product that is further packaged and traded and can also be related to MOD-VAT system. Mechanisms for plowing back profit and availability of credit directly to primary manufacture should be enhanced.

Issues of Credit availability for TST practices is very central. There is not only a need to formulate proportionate mechanisms of industrial and agricultural credit but also well as Credit reservations in banks and financial companies and establishment of appropriate credit access mechanisms need to be suggested and implemented.

Credit issue is directly connected to direct and indirect subsidy issue. Subsidy structure prevalent today is quite averse to promotion of TST practices. It directly discourages local market segments of TST practices in favour of desegmented national and globalised market. How to promote highly segmented market rather than installing our national manufacture regime on globally desegmented market, as is being done? This is a must if we are to avoid global imperial agenda for exterminating large mass of Indian people. Introduction of local sales taxation regimes that promote local segments, Creation of locally administered capital, credit and insurance funds, Creation of local materials control authority, Introduction of local segment promotion conditionality in central credit policy, Selective reduction in central transport and infrastructure subsidy that could promote market segmentation etc. are useful perspectives for policy framework.

Issues Related to Legitimacy of TST Practices and their Intellectual and Other Rights and their Promotion Avenues

Issues related to certification of TST practices and thus legitimising rights to practice them. Issues related to quality certification of products from traditional sector. Issues related to formalisation of peer structure for certification purpose. Legitimacy issue in traditional education sector for TST. Legitimisation of the voice from TST sector in various organisational forms in the area of banking, finance, development and regulation boards etc. set up by Governments.

Issues related to settlement of rights that are due because of traditional practices. Issues related to entitlement of intellectual rights and its enforcement as far as TST practices go. National and International protection of traditional formularies related to vegetable, animal and mineral kingdoms. Retribution mechanisms for entitlement.

Issues Related to Heitus between Modern and Traditional

Interfacing problems at (1) epistemic level, (2) organisational level, (3) entitlement level, (4) development level, and (5) promotional level. Review of various overview approaches. Review of the institutional mechanisms for blending the two and handling crisis situations where traditional practices are on the verge of extermination.

Carving a level playing ground between traditional and modern. Creating negotiation space in the state. Creation of Central boards/Councils for TST. Role of TST resources in welfare and developmental schemes of the Government. Promotion schemes that need to be suggested for various agencies of the Government. Organisational innovations in various departments of the government for giving place to TST promotional concerns.

These constitute three sections of the Policy theme deliberations at the Congress. Besides these three groups of issues there are certain overall policy implications of TST which will be taken up in Plenary session for the Policy theme in the Congress. Issues in the Re-vitalisation of Traditional Industries in India

Mrp-5

A Case Study of Clay Industries

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The development of India has been very adversely affected by the breakup of the network of rural industries which formerly catered to all the rural requirements. Approximately 20% of the total workforce was formerly engaged in local resource based, self-employing, artisanal industries such as carpentry, pottery, weaving, leather working etc. This has been broken by the modern pattern of industrialisation, which can give employment to only a very few people, and hence cannot act as the engine of growth and local regeneration. However, they can offer lower costs, higher quality and predictable properties to the products, and unless these attributes can be assured for the products of traditional industries, they cannot be revitalised. However, several factors such as the viability of raw materials, relative lack of access to R&D and capital inputs, lack of standardisation, lack of marketing infrastructure and the lack of machinery and processes specifically designed

to deal with a flexible and decentralised mode of production come in the way of modernisation of traditional industries.

This paper examines the problems through a case study of the red clay ceramics industry. The Issues involved in the modernisation of this industry are analysed. A number of products which are decentralisable to artisanal levels are discussed. The specific areas needing technological interventions are identified. The need for theoretical knowledge and standardisation are highlighted. Finally, an attempt is made to place the clay industry in the context of other industries and processes for an integrated and coherent pattern of development. The revitalisation of traditional industries can take place only if they are able to establish complementary and mutually re-inforcing relationships with the present industrial systems; a number of ways in which this might be attempted are suggested.

Mrp-6

Cast-out Knowledge, Out-caste Community

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The problem

The outcasting of forms of knowledge relating to the cottage or handicraft production and service sector in India has had a clear link with its colonial past. British industrial and educa-

tional policy in India was an integral part of imperialist expansion worldwide which deemed non-formal spheres of expertise neither *art* nor *science*, only obsolete practices having a largely sentimental value. The dualistic structure Indians inherited from their rulers served to further segregate cultural skills from

the modern economy of human need and desire. Protectionist policies now collaborated with policies of industrial expansion to keep community knowledge and practice ghettoised.

Given this history, it is not surprising that the artisanal lobby in India (unlike the farmers) has tended to remain isolated within the mainstream political discourse. For many, the loss of community resources and skills, is a necessary, indeed desirable economic cost enroute to development through industrialisation. Paradoxically, however, even those sympathetic to the artisanal cause, are largely ignorant if not downright disapproving of the special community character of its politics. In an ideological context, where even to assert group identity is already suspect, the reality of professional jati as distinct from *wage-workers* and *peasants* has become difficult to recognize.

In this panel, the process of outcasting from jati and its work community will be acknowledged as a structural feature of Indian civil society which has remained active even in modern times. But while drawing attention to the exclusionary name of its politics, no simple theory of victimhood will be advanced as adequate to its understanding. The resistance offered by marginalised artisans and agriculturists has been widely documented by environmentalist, feminist and subaltern scholarship. The processes of *sanskritisation*, millenarianism, sect-formation, religious conversion even militancy and separatism documents the paradox of voluntary outcasting (if one may be permitted that term) on the part of those under siege. There is a sense therefore in arguing for the inherently political nature of Indian *caste* and *community* association which merely take on new forms under attack rather than disappear altogether.

Community Outcasting

Political

It is unfortunate that the educated class and its social science has been more preoccupied with the political *correctness* of Indian civil society rather than its examination. In such a context, the complex link between separatist politics and non-modern, non-standard heterodoxies has gone largely unexamined. Even those willing to recognize the competitive, political impenis to Hindu jati formation, have done so only in theory or in relation to an oppressive past. The *popular* culture of contemporary community politics is for them nothing other than a farce-mere raciest, militant *rhctoric*, totally illegitimate and toothless in the modern Indian State. In effect, civil society and its apparently *unsavoury* politics has been outcasted from enlightened independent discussion in the Indian university.

Academic

This innate conservation of Indian social science is evident from the undue attention paid to Hindu peasant society rather than to its manufacturers, artistes and artisans who are by definition (not by chance) land-less, minority segments of

client populations. Equally, undue attention has been paid to the Hindu joint family rather than to the extended or *fictive* kinship and professional community of the guru-shishya or ustad-shagird traditions prevalent in art, healing and manufacture. The emphasis on *sanskritisation* and *upward social mobility* in caste society presents only the official view of Hinduism. Community closure around cultural symbols such as food, work and sex certainly reflects stams anxiety in conservative landed society. But equally, it reflects group *subversion* of the varna model not slavish *imitation*

Urban/Economic

On another plane, the promised upward mobility through urban migration and industrialisation has only been for some - the already rich and the landed. For the majority, as the streets of any modern Indian city demonstrate, the reality is one of spatial and cultural outcasting from the city's cosmopolitan life-style and aspirations. The skilled worker of the village or town remains only a step away from the *lumpen proletariat* of the city - a reject from the creative urban art sector as also the festonished commodity sector of trademarks and brand names. Ousted as a producer by the up-market smdio-artist and entrepreneur, the craft person has also been ousted as a consumer from the self-enjoyment of craft productions.

Educational

It is the middle class today which provides solid patronage to the modern craft industry as the ethnic veneer of an increasingly urban, westernised way of life. The large amount of expendable income generated in the liberalised Indian economy has in fact permitted them to perpetuate this dualism even in the sphere of education. More than a hundred and fifty years after Macaulay, the market for education - and all that money cannot buy - continues to reflect colonial, utilitarian preoccupations. Syllabi and laboratories remain notoriously free of any dialogue between the head and the hand, the formal and the informal the engineer and the artisan,. Different cultures of science and technology are not even considered as models for experiment. Whatever the grim realities of outcasting processes in the Indian past, today it is the market and the university, both embodiments of the ideology of equal opportunity which provide them with their primary motive impulse.

The Question

If then it is enlightened classes and their institutions, which are so thoroughly implmented in the de-skilling and de-humanising processes at play in Indian society what intervention if any, is possible for them which remains both within and without the political discourse of the community?

Consciously couched in the language of self-indictment this question presumes a panel drawn from among artists, activists educationists, political workers, architects and urban planners, culture patrons, academics and media persons who are old-fashioned enough to be provoked into responding and not just

lapsing into an all forgiving, post-modern silence. Equally consciously, there is no invitation sent out to industry or MNC representatives to *stand in the dock* so to speak. The intention is clearly not to let them go scot free but to acknowledge the

facelessness of their power which, in true artisanal spirit, can only be dealt with through self-closure, introspection and non-cooperation - at least for the present.

Workshops

The Workshop at the Congress are aimed at imparting functional skills in specific areas of traditional knowledge, to well defined target groups. The exposure so gained by the participants, it is hoped, will also spur them on to a deeper involvement with traditional knowledge and practice. These

workshops are being conducted by eminent resource-persons in the respective areas. Enrollment for the workshop is not contingent upon registering for the Congress. The following six workshops are featured in the Congress:

Wsp-1 Ayurmela: Introduction to Self-help Techniques based on Ayurveda

About the Workshop

Ayurmela gives an introduction to the basic principles of Ayurveda, daily and seasonal regimen, concept of food and nutrition, simple remedies for common ailments and preparation of simple formulations such as choornam, kashayam, lepam etc.

The objective of this workshop would be to propagate the importance of Ayurveda in day to day life. The workshop will impart the skill of preparing Ayurvedic concoctions using home grown plants for various primary health care requirements.

Co-ordinator

Vd. Shyam Sundar is a practicing Ayurvedic physician, presently working at the Centre for Indian Knowledge Systems (CIKS), Madras, as a Research Associate. He has brought out monographs on various topics of Ayurveda.

Target Group

The Workshop is targeted at individuals in the age group of 15-50 years. Anybody with an interest in the subject is eligible for participation.

Wsp-2 Indigenous Toy Making

About the Workshop

This workshop seeks to impart simple toy-making skills using easily available materials. These bring to children the joy of learning at the thrill of doing, with the freedom to experiment.

Co-ordinator

Sudarshan K. Khanna is a designer and educator at the National Institute of Design, Ahmedabad. He has been keenly involved

in research, documentation, design and development of Indian Toys. He has conducted several Workshops, presentations and exhibitions on various aspects of Indian toys and toy-makers.

Target Group

The Workshop is targeted at children aged 10 and above, science and craft teachers who are keenly interested in making toys, and work together with children, are also welcome to participate.

Wsp-3 Science and Technology of Vaastu

About the Workshop

Vaastu Shastra, the traditional science of architecture, is witnessing a substantial revival of interest and patronage in recent times. This workshop seeks to give an exposure to the principles and practice of Vaastu shastra, with special emphasis on housing architecture, including practical aspects of design-generation and house patterns.

Co-ordinator

Vaastu Vedi Dr.V.Ganapathi Sthapathi is an eminent practitioner of Vaastu Shastra, who has built a number of temples and

other monuments in India and abroad. Formerly the principal of the Government College of Architecture and Sculpture at Mamallapuram, he is now the Founder and Research Director of the Vaastu Vedic Research Foundation at Madras.

Target Group

Degree/Diploma in Civil Engineering, B.Arch, M.Arch, B.Sc. (Temple Arch.), Final year students of Architecture/Civil Engineering and B.Sc. (Temple Arch.)

About the Workshop

Bamboo is a remarkable material, occurring naturally in tubular form with more strength per unit weight than steel. This material has been traditionally used in a variety of architectural and other applications. With innovative design inputs, this versatile material can serve even modern requirements in startlingly elegant ways. This workshop will give an exposure to these possibilities.

Coordinator

Vinoo Kaley is an architect who has devoted himself to studying and furthering traditional building materials and tech-

niques, for about two decades. His involvement with bamboo is not merely as a construction material, but as a material that can be skilfully used for making a variety of goods of day-to-day use. In association with artisans, he has developed a variety of innovative products made of bamboo -- suitcases, sling-bags, furniture, soap-box and even visiting cards. He has also worked extensively in the use of mud as a building material, and has a number of publications on these topics to his credit.

Target Group

Anyone above 15 years of age with some interest in the skill.

Wsp-5 Application of Computational Paninian Theory to Machine Translation of Natural Languages

About the Workshop

Over the recent years there has been a lot of effort towards computer translation from one Indian language to another. Paninian grammar has been found to provide some of the best tools towards this. The workshop will introduce the subject.

Coordinator

The workshop is to be conducted by Dr. Rajeev Sangal. Dr. Sangal is Professor in Department of Computer Science at IIT,

Kanpur. He has been working in the area of machine translation over the past 8 years. He has published books in the area of Artificial Intelligence and an Machine translation.

Target Group

Graduates in Science, Engineering and Linguistics

Wsp-6

Computational Indian Maths

About the Workshop

India is known to have made significant contributions to the area of mathematics for over centuries. Perhaps the most significant contribution has been the place value system of representing numbers. A indepth understanding of this has enabled Indians in all walks of life to work out computation technique, useful to their specific vocation. Thus different methods of checking a addition or multiplications, carrying out square of a number or square roots, finding area of a rectangle have been evolved, many of which can be carried out almost orally. This workshop will introduce some of these simple techniques. Many of these techniques are valuable even today.

Co-ordinator

The workshop is to be conducted by Dr. Ashok Jhunjunwala and Ms. Ranjani Parthasarathy. Dr. Ashok Jhunjunwala is a Professor in Department of Electrical Engineering at IIT Madras and has written a book titled Indian Mathematics. An introduction in 1993. Ms. Ranjani Parthasarathy is a lecturer in Computer Science Department at Anna University. Her Phd work includes evaluation of some computer algorithms based on old Indian computational techniques.

Target Group

School children of classes 9 to 12, first/ second year college students.

Keynote Addresses

Role and Concentration of Viswakarma Community in Indian Civilisation and Culture

N.N.S wamy

Mysore

Bringing out the relevancy of the theme, i.e. role and contribution of Viswakarma tradition, the sources of the tradition, characteristics of these sources, their science and spirituality and their interaction with society and culture are discussed at the outset. This covers the genesis of Viswakarmas and their yeomon services and contribution to Indian culture.

Etimological definition of the term *Viswakarma* is discussed along with its meaning under the modern context. The question as to whether Viswakarma is defined as a caste or tribe is examined and analysed. The point that Viswakarmas are known as the aboriginal creators and vastu shilpis is established.

With a detailed schematic study of the ancient scriptures on art and architecture, a new light is thrown on the tradition of Viswakarmas. Fragmentation and alienation in respect of this tradition is seen at all levels. Main causes for this and for disharmony and confrontations are brought out here. Various problems under the contemporaneous stress faced by the Viswakarmas are discussed.

Almost all the scientific, technological, cultural, social and religious ideas were and are being originated by these Viswakarmas who are at present neglected by the society. They must be given their original status and privilege as they are the creators and all-doers of the modern world.

The Traditional Sciences and Technologies of Viswakarmas

S.P.Sabharathnam

Vastu Vedic Research Foundation, Madras

The term Viswakarma, which has varied shades of meaning, one of them being *all-doer*, includes within itself an inseparable aspect called *Visvajna*, whose one of the meaning is *all-knower*. A person endowed with the supreme capacity of doing all things should necessarily have down those things. Doership presupposes knowership. Knowership belongs to science and doership belongs to technology. So when we proceed to speak about the tradition of Viswakarma, the twin field of science and technology from the tradition of Viswakarma points out to the fact that the Viswakarmas are ingeniously endowed with scientific vitality and technological vigour.

The tradition of Viswakarma, which has its beginnings in time immemorial, had attained its acme of skill and dexterity even during the Vedic period. It is absolutely unjustifiable to explore the sequential process of Vedic yajnas, ignoring the inimitable contributions of Viswakarmas. Any Vedic yajna was essentially in need of at least 320 utensils and implements made of varied things such as clay, stone, wood, fibres, iron, copper, silver, gold etc. and these were made according to the prescriptions and proportions supplied by the Viswakarmas. The potency of their scientific knowledge and technological skill in making these vessels and utensils of varied dimensions could be understood from the Vedas themselves. At least 10,800 bricks of different geometrical shapes were needed for the yajnas and these were made only by the Viswakarmas. Without the help of potter, weaver, carpenter, smith, Sthapati -- all belonging to the tradition of Viswakarma, the accomplishment of Vedic yajna could not have been possible. The Viswakarmas of the Vedic period were well-known for fast-running chariots and carts, for gold crowns, for *thousand-eyed* castles, palaces,

houses and so forth. The chapter known as *Karanadhikara Laksana* which occurs in most of the Sivagamas throws more light on the sciences and technologies of Viswakarma.

The mature state of human society is measured by its self-sufficiency in food, clothes and houses and we could see the remarkable contributions of Viswakarmas in all these three basic needs of a society. The human society has its other facets also spiritual training, art, defence and armory, civilisation etc. To these, the tradition of Viswakarmas has been contributing a lot, all through the bygone ages without any interruption, though it has suffered ignorance and marginalisation.

The scientific study of sound and light, of geometrical designs, of planetorial movements, of the structure of earth, of ecology, of metals and gems-all these and related fields have been their inevitable pursuits. The skilled persons of this tradition evince an astonishing degree of accuracy in the application of scientific concepts. They have been preserving the inimitable way of application of technological principles, for the fact of which reference could be made to Sri.Arunachala Achari of Salem and Everest Somasundaram of Coimbatore.

The entire gamut of human society gets adored and adorned by the countless creations and commendable services of the tradition of Viswakarma which is fostering the sciences and technologies with fervid.

The perfect state of Nation is maintained by harmony and harmony is gained through proportions and relative dimensions. The science of proportion and dimension is the very breath of Viswakarmas. As such, the Nation should see that they are not thrown out of their propotion and dimension.

key-3

Pottery Today and Tomorrow

Kodumudi Shanmugam

PWD, Salem

Pottery, as a Cottage Industry, has played a stellar role in the past, in satisfying the utensil needs of the entire society. When the civilisation dawned and led the man to turn from raw food to cooked food, the mud vessels so ingeniously and meticulously churned out by the potter were the only means of cooking and storing food and foodgrains.

The potter community people in any village catered to the needs of small individual families as well as to the needs of various serial get-togethers like marriages, festivals etc. by producing vessels of various sites. The amount of planning and meticulousness which go into such gigantic preparation must be seen to be believed.

Chatti, Paanai, Modaa, Saalu with various suffixes are some of the Tamil names for the mud vessels in existence. These were

used for various purposes depending upon the size and need.

Apart from the usage of vessels, the potters produced materials for the shelter needs of the people also. Clay tiles were used as roofing material to protect from Sun and Rain. Potters tiles and Pan tiles are such products still having its hold in the industry.

On the culture front also, the village temples of Tamil Nadu receive the figurines of human beings as well as that of animals like horse, bullocks, cow, ram, rat, snake dog etc as offerings to Gods during various festivals.

Instead of persisting the potters to manufacture what they know and what they were producing so far, new avenues based on the utility needs of the modern times have to be investigated and the services of the potters should be made use of.

key-4

Padmasaliyargalin Ethir Kala Kanavu Padmasaliyar's Future Vision

Tamil Nadu Padmalaliar Association, Madras 600 028

This is a statement of the Padmasaliar communities' response to the present socio-political scenario. Specifically, it details

their various demands from the government including inclusion in the most backward list.

Included as paper no:19 in the Tamil section

key-5

Marivarum Suzhnilaigalil Kaithari Handloom Industry through the Age

Anakaputhur Ramalingam

No.6, Thiru-Vi-Ka Road, Anakaputhur, Madras 600 070

During the days when cloth was woven only on throw-shuttle looms, our cloth was exported to various countries. A diversity of techniques and processes led to a wide variety of fabrics which became famous all over the world. Even today, large

numbers of skilled weavers well versed in various techniques are present amidst us. Given the right initiatives, they can play a very productive role.

Included as paper no:20 in the Tamil section

key-6

Handloom Weaving: A Traditional Art and Occupation

C.P.Dhamodharan

251, Trichy Main Road, Gugai, Salem 636 006

In the civilizing process members of the Devanga community, descendants of *Devala-Maharishi*, took the profession of weaving. Members of the Devanga community are spread throughout the country, speaking the local language but wor-

shipping their community deity, *Shri Sowdeswari Amman*.

Generally, weaving in India - either Handloom or Powerloom - is a family activity, with each member contributing in varying

degrees to the processes involved in producing cloth. This Traditional Art is instinctive to the members of the weaver family, which does not require any coaching, as per the Tamil saying *Kula Thozhil Kallamal Padamagum*

A majority of the Handlooms are engaged in weaving cotton fabric. Silk and Wool are also used but to a smaller extent. In our country cotton has been grown, spun, woven and patterned even before the dawn of recorded history. The variety of textures, weaves and designs produced on handloom is infinite, ranging from the finest muslins to heavy rugs, from appealingly simple to fascinatingly intricate composition with suitable coloured yarn.

Weavers themselves are increasingly accepting that Powerlooms are the newest stage in the evolution of Handloom Weaving. It is futile to distinguish *Handloom* and *Powerloom*

merely on the basis of Human Muscle Power and Electric Power. It is widely perceived that the two kinds of looms are not engaging two different ways of fabric production. To meet the per capita requirement of the Indian people, employing Powerloom has become imperative.

A misconception prevails over the country, at present, that Handlooms would die away by accepting Powerlooms. As said elsewhere Powerlooms are only replacements of Handlooms. The same Artisan, the Handloom weaver, has taken up the occupation of Powerloom weaving. So no Legislation by Government, either Central or State is warranted to check the decay of Handloom Weaving as the mode of weaving is not at all affected, rather production is enhanced to cope with the increased demand due to better international trade.

key-7 Traditional Science and Technologies of Artisan Fishing Communities in India

Thomas Kochery
PCO, Trivandrum

Fishing is done world over and is as old as hunting. It is even older than agriculture. People close to water bodies used their bare hands for catching fish over decades and centuries. They developed simple tools like harpoons and hooks and lines. Rafts followed by Kattumarams canoes (small and big) along with nets of different types came to be used later. In India the traditional fishery science has a long history, as old as fisher people themselves. As opposed to this the modern fishery science in India is only voluntary national. India is a big country and has a long coastline of over 8000 Km. The fish-able area within the Exclusive Economic Zone of 200 n.m from the shore is 2.02 million Sq.Km. There are 7.5 millions fishery dependent people and one million fish workers in the traditional 200,000 country craft, out of which 30,000 are motorised units. The artisanal fishermen account for 63% of the marine fish production (33% by the non motorised craft). The mechanised sector with 35,000 boats contributes 35% and the rest 2% is shared by the deep sea fishing vessels. Prior to the advent of modernisation/mechanisation, the artisanal fishing communities were harvesting the fishery resources within their sustainable limits. The modern intelligentsia poo-hooed the capability of the traditional fishing communities as primitive benefit of scientific importance. Hence fisheries development in the country, nay in the whole spectrum of the developing nations, was conceived through a process of modernisation as a panacea to all the inherent problems in the sector, including poverty alleviation and socio-economic uplift of the people. Thus development in the first thirty years of planning in India except in a couple of states was in total disregard of the artisanal sector and the traditional fishing communities. Only when the fishermen gathered together under the banner of fishermen unions led by the National Fish Workers Forum (NFF), Government began to recognise slowly the claims of fishermen as valid and scientific. They thought of introducing measures to protect the interest of fishermen and the resources from depletion in response to strong pressure from below.

The innovations in the artisanal fishing communities were not made over night. The fishermen learnt the art of fishing, knowledge of the sea, seasons and the fish through practical orientation over long years of heritage. They shaped their own tools and implements over generations to suit the seasons and species. They harvested the resources according to their needs which was within the sustainable limits. The very passive nature of their fishing could not make them over fish, the resources.

Gathered Momentum in the Eighties

The system of traditional knowledge and skill on fishing gathered momentum in the eighties as a result of the relentless efforts taken by the social scientists and NGOs through proper documentation of the people's innovation, professional pursuits, practices, etc. In 1894, the first international meet of the fishworkers was held in Rome as a counter to the FAO world conference on fisheries. The participants from all over the world, particularly the developing nations of Asia, Africa and Latin America for the first time exchanged their knowledge of the sea, harvesting techniques of the resources, the craft and gear used by them across the language barriers through picture posters, and other visual aids. The Rome conference was well received and lauded even by fishery scientists at international levels. It ignited the world movement of fish workers (ICSF). The ICSF has its own publications containing well documented features, articles and related write ups highlighting the achievements of artisanal fishermen and fisheries. I see before me here quite a good number of my bosom friends who have been the guiding stars and torch bearers of ICSF. But in their midst I miss a conspicuous personality, a great fighter, who stood in the vanguard, to champion the cause of fishermen in the coastal belt and the tribal people in the forests, who never forgot the basic link between the sea and the forests as the very essence of life of

humanity. That was John Fernandez (43), the great charming personality and environmentalist from Kerala, a product of the fishing community. He entered the heavenly abode on September 9, 1994 while engaged in close pursuit for moulding the two classes of traditional workers of the lowland and the highland. He had several publications to his credit. He highlighted the greatness of the people's sciences practised and developed by the fishermen in national and international fora. Some of the innovations which took place in the artisanal sector were actually as a result of the challenges taken up by the fishermen. When they realised that their fishery is being depleted and annihilated, they not only protested against the on slaughts of the mechanised sector, but also tried to develop their own ways of habitat regeneration. Thus came the artificial reefs. They knew from their own experience that these would enrich biomass formation and growth of fishery resources as well as aggregation. The artificial reefs developed in the coastal waters of Trivandrum District (Kerala) in the eighties bore ample evidence of the science behind the thinking of fishermen.

The Kerala State Department of Fisheries took interest in fishermen's innovation of artificial reefs. They showed interest for a joint venture with an NGO viz the Programme for Community Organisation (PCO) - in 1993/'94. The Government was to provide funding support while the PCO to contribute technical input (ie, build and transfer modules for the reef) and organise the fishermen in the villages to join the scheme. This was conceived as rehabilitation programme of the traditional fishermen in Pozhiyoor who were engaged in illicit liquor brewing trading activities for years. The fishermen were convinced of the importance of artificial reef as a more acceptable and respectful occupation. A professional team of biologists/cum scuba divers from Southampton University, UK who covered some of the artificial reefs with videos. These provided convincing evidences of biomass formations on the artificial reefs. The videos were telecast by the Government of India Doordarshan Network Programme to the benefit of the television viewers of the country. Today the State Government has been showing greater interest in setting up more artificial reefs in Kerala in liaison with NGOs.

Traditional Science Not Static

We find that there is science in the traditional fishing and ancillary net making, fish processing activities pursued by the fishermen. While the Central Fishery Research and Development institutions have been aiding and abetting the modern sector systematic growth, the traditional sector had been well left outside the purview of such assistance from scientific institutions. The task was left to the fishermen themselves to mould their development innovations.

In the face of growing threat of resource depletion and marginalisation, the fishermen on their own keep on mutually learning new techniques to improve their fishing capabilities. They keep their eyes and ears open and depend on exogenous as well as endo-

genous influences to choose the appropriate technology, if necessary to chisel out it to suit their specific requirements. We have innumerable examples of these in year development process. Followed by the colossal crisis in fishing in the second half of the seventies, the artisanal fishermen developed a special artificial trait called *misem* in hooking fish. Similarly, a light was used in fishing during the night; the light attracted fish and resulted in higher catcher to the users. A disco-net (trammel net) came to be developed for netting prawns which benefited the artisanal fishermen. While the trammed net was effective in catching prawns this did not have any adverse impact on the resources as trawling. The traditional encircling net was developed into a ringseine on the model of a purse seine capable of catching large shoals of small pelagists like oil sardine and mackerel. Even a mini trawl net was fabricated by the fishermen for using from the motorised craft.

Future Outlook

The traditional science in the fishery field has been growing. The fishermen have been able to get net rieved from the leap into the absysmal dentas to certain extent. Yet they are far behind the precisis level. In Kerala 95 percent of the fishermen (including both the mechanised and artisanal fishermen) are below the poverty line. Vast majority of them do not have proper dwelling houses or minimum environmental sanitation facilities. The social and economic conditions of fishermen are deplorably low. They have been marginalised by the modernisation process. Today the fishvending women have to travel longer distance, spend more hours outside their home and invest much higher capital to remain in their trade.

Modern fishing technique aided by mechanical propulsion leading to heavy entropy of energy. Eventhough the physical output increases, the fishermen do not get the advantage of the increased catches. Much of the cash inflows go to meet the fuel costs, wear and tear of equipment and a number of intermediaries. The net cash flows accruing to the fishermen will be meagre. Thus the real situation is such that poverty is seen perpetuated in the sector on account of over investments and wrong choices of priorities.

There is no integrated national fishery policy for the country as a whole. The deep sea fishing policy followed by the Ministry of Food Processing Industry is anti-people and anti-fishermen. The fishery officials and scientists follow the line of the Ministry. The fishermen and their supporters are, however, building up public opinion against the licences given to foreign vessels to look our deep sea resources will lead to greater erosion of our already marginalised resources in the coastal sea as well. We should not allow our slender resources to be plundered by big factory ships-whether foreign or Indian. I appeal to the traditional fishery scientists and supporters to sharpen the tools for the fishermen to go out beyond the inshore sea and help unions to harvest the resources in the offshore waters to the benefit of the fishermen and the consumers of our country.

P. Krishnakumar

AVR. Educational Foundations of Ayurveda, LSPSS, Coimbatore

The need of the time is to develop the traditional health care as a people oriented health care system. The factors that dominated the health care structure of our nation has been systematically pushing the traditional systems of medicine away from the main stream. In this background, an attempt has been made to reflect upon one's own experience, to understand the pattern of domination and to probe and suggest further on what could be the possible alternative development strategy and suggest specific tasks that would help define the development problematic in a meaningful manner in order to progress further in a self-determined fashion.

Perspective

1. Prejudice has always vitiated the appreciation of the achievements of our traditional systems of medicine.
2. The foreign domination and internal strife drained not only our coffers but also the rich treasure of our culture, the science and technology, including Traditional Medicine a science of life was a vital part of our people's lives.
3. The false values that was introduced and later perpetuated by the colonial pores made us look down upon with contempt on our own systems of health care.
4. With the advent of national independence, the biased leadership at the political, bureaucratic and technocratic levels set about perpetuating the colonial ways by establishing medical institutions throughout the country in the colonial lines and accepting the allopathic medicine as the panacea of all our ills except that now the health map of our country is dominated by the interests of the commercial medical establishments (with the multinational as the power center).
5. The domination of this model and its perpetuation has led to the neglect of our rural health services which were starved of resources and the technical and professional content of the health care delivery system remaining solidly apathetic to the real health needs of the society.
6. In view of the fact that western medicines and models have proved failure in Indian context it has become very clear that to meet the health needs of our rural population an alternative health care delivery system has to be evolved.
7. Any health care system to be really meaningful and effective must be culturally, socially and environmentally closer to the people. Our traditional system of medicine are admirable suited to be the most viable alternative health care delivery system.
8. The dominant medical system now seems to be full of contradictions.
9. The gradual erosion of faith in the biomedical model and its institutions, the growth and popularity of different

systems of medicine, the imaginative bold policies and programs of international bodies like WHO tailoring traditional systems of medicine to meaningful projects to the maximum extent possible, all these show in which direction the wind blows.

10. The one argument that the dominant interests advanced against Traditional Medicine is that it has not kept pace with modern scientific teaching and as such it is not scientific.
11. The so called modern medical science poses itself scientific and condemns other sciences as unscientific, when this science itself is in an almost never ending process of controversies, proofs and disproof, is adequate proof of the authoritarianism and intolerance.
12. To expect western system of medicine riddled with limitation and high cost, to deliver goods to meet our peculiar health needs is indeed a fallacy.

In spite of all the limitations, modern medicine continues to be promoted as the only rational answer to illhealth. Obviously modern medicine cannot be the only answer to diseases as it came into being a mere hundred years ago. Human populations have managed to survive for centuries in extremely diverse environmental conditions, without becoming extinct. It is important for us to understand the mechanisms which made this possible if we are to overcome the limitations imposed by modern medicine and evolve alternative systems of healing.

Given the above scenario it is for us now to reflect on our experiences and chart out the future course of action in a decisive manner. It is all the more imperative the traditional systems of medicine from oppression and make it a viable alternative for our people.

On Research

The history of science is replete with instances of faith in reason and vision of truth. At every step from the conception of a rational vision to the formulation of a theory, faith is necessary in the vision as a rationally valid aim to pursue, faith in the hypothesis as a likely and plausible proposition, and faith in the final theory, at least until a general consensus about its validity has been reached.

This faith is rooted in one's own experience, in the confidence of one's power of thought, observation and judgement. While irrational faith is the acceptance of something as true only because an authority or the majority or those who count, says so. Rational faith is rooted in an independent conviction based upon one's own productive observation and thinking.

Claud Bernad, the great French physiologist said *Good methods can teach us to develop and use to better purposes the*

faculties with which nature has endowed us, while poor methods may prevent us from learning them to good account. Thus the genius of inventiveness, so precious in the sciences, may be diminished or even smothered by a poor method, while a good method may increase and develop it.

- a. The existing bureaucratic power structure of our medical research system who is supposed to guarantee the integrity of scientific research has lost its autonomy and has become a tool of main stream medical establishments.
- b. Ideas get accepted because their protagonists are members of the elite and more seriously good ideas may be ignored because their advocates have poor-standing in the social structures of science.
- c. The social structure of science is determined by the dominant interest that creates, controls and governs the general movement which is detrimental to the well-being of our people in general.

On Development

The very idea of progress is called a childish illusion and *realism* a new word for the utter lack of faith in man, is preached instead. The idea of the dignity and power of man which gives men the strength and courage for the tremendous accomplishments of the last few centuries, is challenged by the suggestion that we have to revert to the acceptance of man's ultimate powerlessness and insignificance. This idea threatens to destroy the very roots from which our culture grew. Rational authority has its source in competence. The source of irrational authority on the other hand is always power over people.

The paralysing effect of power does not rest only upon the fear it arouses, but equally on an implicit promise-the promise that those in possession of power can protect and take care of the *Weak* who submit to it. Power on the one side, and fear on the other, are always the buttresses on which irrational authority is built. Criticism of the authority is not only not required but forbidden. Rational authority is based upon the equality of both authority and subject, which differ only with respect to the degree of knowledge or skill in a particular field. Irrational authority is by its very nature based upon inequality, implying difference in value.

To give an example to the above fact, 10 years back one of the UNbodies requested us to draw up a major development project of global relevance which would not only have helped the growth of traditional systems of medicine. In fact, this project would have ensured the strengthening of the essential base of traditional systems of medicines, especially the area of medicinal plants resource development which in itself is a major step. The relevance and the seriousness becomes all the more evident in the background of the systematic destruction of our forests and environment which is already reaching a crisis stage. The success of this venture would have given us a new dimension for growth and progress and strength to stand against the onslaught of those who perceive a threat to their narrow interests. Our draft proposal drawn up with meticulous

care and foresight was received very well by the UN body. To be approved, this proposal would have to be cleared by the national bureaucracy.

This project was considered to be of no relevance by them and scuttled outrightly.

The point here is not that we lost a project but the chances to revamp a new area which would have served the needs of millions of people if not the world over.

The lessons one must learn from this are

- a. The existing bureaucratic power structure of our national development programme who is supposed to ensure that decisions are made catering to the needs of the people has lost its autonomy and has seemingly become a tool of the vested interests.
- b. Programs get accepted because their protagonists are members of the elite and the powerful and more seriously good idea may be ignored because their advocates have poor standing in the power structure of the society.
- c. The development programs are determined by the dominant interest that create, controls and governs the general direction of *progress* which is detrimental to the well being of our people in general.

On Planning

If man had adapted himself to external conditions, automatically, by changing his own nature, like an animal, and were fit to live under only one set of conditions to which he developed a special adaptation, he would have reached the blind alley of specialization which is the fate of every animal species, thus predicting history. If, on the other hand, he could adapt himself to all conditions without fighting those which are against his nature, he would have had no history either. Human evolution is rooted in man's adaptability and in certain indestructible qualities of his nature which compel him never to cease his search for conditions better adjusted to his intrinsic need.

Our institution once had the privilege (if can be called that) to be a member of a committee of a very important national body where the nation's next five year plan in health and more precisely in the traditional systems of medicine is formulated, discussed, reformulated and decided. Almost all the members of this committee, with their all too obvious show of self-importance, unleashed a plethora of ideas and plans in an apparent show of concern and justification for assistance for the traditional systems of medicine. From our side we too suggested some concrete proposals on the need for the development of medicinal plant potential of the nation, because after all this is a prime necessity for the practice of our systems. The members unanimously supported the proposal. To our utter dismay we find a bureaucrat - the member secretary of this committee decided to recommend a miserable sum of money for the proposal which would not even suffice for fencing the esti-

mated area for this project. Incidentally and most interestingly unlike other member secretaries of other committees of this national body, he was neither an expert in the area in which he was to judge nor competent and experienced enough with the subject and issues involved. This is proof enough of the utter disregard of traditional systems of medicine.

The lessons one must learn from this are

- a. The existing bureaucratic power structure of our national planning system who is supposed to guarantee that plans are appropriate to the needs of the peoples has lost its autonomy and has become a tool of vested interests.
- b. Plans are accepted because their protagonists are members of the elite and the powerful and more seriously good plans may be ignored because their advocates have poor standing in the power structure of the nation.
- c. The social structure of planning and decision making is determined by the dominant interests that creates, controls, and governs the general movements which is detrimental to the well being of our people in general.

Of course, there are large-hearted personages among bureaucrats as well as Scientists and Doctors of Western medicine but most often, by virtue of their large heartedness and tolerance, do not wear the robes of an autocrat and are helpless to push through their ideas and so much so, even though they have a soft corner for our system they are incapable of giving any substantial worthwhile contribution to our system.

What now?

If this is the fate of traditional systems of medicine in a progressive and democratic country like ours, I am sure the situation cannot be different-possibly worse in other countries. Experience of countries like the Peoples Republic of China and North Korea clearly establishes the fact that change is possible.

Towards a new development strategy

Traditional system of medicine exists and its significance lies on account of it being a peoples system. If we are cooped by the dominant system, it loses its relevance as an alternative system. On the other hand if we follow the dominant trends of development in an attempt to keep up with the so called *modernisation* under the false premise that is what mankind needs, then it again results in the loss of its relevance as an alternative system. Then the system itself loses its fundamental base and strength and degenerates into another set of products to be produced by the big industries, to be marketed by the big business for consumption by the rich, all for a comfortable profit. The obvious way to combat this menacing prospective and to maintain and strengthen these systems as viable alternative system in health sector is to move decisively towards a new development strategy.

The thrust of this new strategy is through an alternative conception of its development which gives due regard to its endogenous character and to autonomy or self-reliance with self-control and focussed towards fulfillment of the needs of the people. This implies our willingness to reassert our rights to determine and act upon our needs and priorities. This is possible more for non-governmental organisations (NGOs) involved in traditional systems of medicine to forge strong horizontal linkages at the local, national and the global space. The NGOs are in a position to take up the leadership precisely because of their freedom to move out into newer areas with newer insights through innovative methods.

The need now is to broaden participation in the development discussion by the creation of a platform to the *third system* that is concerned individuals; research, educational or people's organisations as distinct from the inter governmental (or intra-governmental as the case may be) organisation (the first system) and the transnational corporations (the second system).

The role of the third system has by now been acknowledged as a hope for humanity in recent times, in the struggle for a more human alternative in areas of alternatives as information and media, health care, energy, science technology, finance, development etc.

It is indeed time that we open ourselves from the narrow confines for which none else but we are responsible and rise to extent our hand within this third system and this alone will ensure the survival of our traditional systems as systems itself in its pristine glory, vitality and social relevance. This is all the more vital for Third World Countries.

The task ahead

The Challenge of Deforestation

Every second of every day, a tropical forest the size of a football field is destroyed with cumulative consequences that cross national borders and affect us all. Deforestation cords the biological diversity of life, itself, since tropical forests are the habitat of almost half the plant and animal species on our planet. At loss is the diversity of life forms that hold promise for scientists to discover new medicines, crops and industrial applications (Fowler et al 1988). Forest peoples lose their homelands and humanity loses generations of their traditional knowledge of the use of forest resources. Deforestation diminishes forests ability to moderate climate and the loss of forest cover exacerbates soil erosion and flooding, increases siltation in rivers and estuaries, and disrupts regional hydrological cycles.

A vicious cycle of poverty, destructive population and consumption practices, poor land use and land tenure policies and inappropriate development has doubled the rate of tropical deforestation in the past decade (Moran 1991).

The value of Biological Diversity

Tropical forests represent laboratories of biological resources critical to humanity, particularly medicinal plants. Although the amount and value of this wealth of biological diversity has not been calculated. We do know that one fourth of the prescription drugs on the market in the U.S. today are plant-derived. It is estimated that in 1990, American consumers spent over \$15.5 billion on prescription drugs which contained active ingredients extracted from plants.

The Value of Cultural Diversity

similarly, peoples who live in or near tropical forests represent libraries of information on the use of plants for medicinal purposes. According to the World Health Organisation, 80% of the population of developing countries, about 3.5 billion people, depend on plant-based traditional medicine for their primary health care. But the traditional knowledge of plant use by the gene-rich developing world is valuable to all of humanity as scientists from the gene-poor industrialized world use it for leads in therapeutic drug discovery and research. Of the 120 active compounds found in plants and used in Western medicine, 74% have the same therapeutic use as in traditional societies. This knowledge is embedded in forest peoples cultural systems. Accumulated over millionia, traditional knowledge is as rich and diverse as tropical forests biological resources, and it is equally as threatened. Since 1900, due to outside encroachment, introduced diseases and loss of habitat, extinction has been the fate of an average of one indigenous culture each year in the Amazon region alone (Cultural Survival 1991).

Local communities and Rights

The *Strategy for Survival* puts community empowerment as a cornerstone for responsible development and effective biodiversity conservation.

Most of the creative and productive activities of individuals or groups take place in communities. Communities and citizens groups provide the easiest means for people to take socially valuable action as well as to express their concerns. When they are properly empowered and informed, communities can contribute to decisions that affect them and play an indispensable part in creating a sustainable society.

Indigenous peoples also provide valuable resources and knowledge. Traditional knowledge of plant animal use, including methods of preparation, storage and management, is of global economic significance. Their biogenetic resources already form the basis for sizeable seed, pharmaceutical, and natural product industries. Natural resource management, soil fertility maintenance, stream and coastal conservation, and forest and agricultural system models provide viable, time-tested options for sustainable development adapted to micro-climatic variations and local socio-political ecosystems.

In case of Survival of every Traditional Systems of Medicine Subject to its national legislation every agency one should respect, preservation and maintenance of indigenous and local communities. They should act towards respect, preservation and maintenance of indigenous and local communities.

Promotion of the wider application of traditional knowledge, innovations, and practices

Involvement of indigenous and local communities in implementation of all aspects.

Equitable sharing of benefits resulting from use and application of traditional and indigenous knowledge, innovations, and practice.

Care for Resource Base

Foreign visitors to the country used to carry back with them numerous manuscripts. The superb collection at the famous well-come Institute of History of Medicine (London) is tribute to the enthusiasm shown in this matter by Sir Henry Welcome. Manuscripts are also available in the libraries of Berlin, ham-burg, Munich, Paris, Oxford, Vatican etc.

It is estimated that around 1,25,000 Sanskrit manuscripts are available in the world at present. Of them a considerable segment is on Ayurveda and related topics. A recent survey carried out by Institute of Asian Studies (Madras) reveals that 65,000 Tamil manuscripts are available in 70 institutions all over the world.

In spite of the much - talked about revival of interest in traditional medicine, the manuscripts available in India have not at all been put to any worthwhile use. Curators of these palm leaf bundles of ancient vintage. Occasionally some senior scholars do consult them, but only in connection with their researches on literature of philology.

Disinterest in the manuscripts and wanton neglect by authorities slowly cause the decay and eventual loss of these collections. It is high time that effective measures and programmes are adopted to save these veritable repositories of medical knowledge before they are devoured by vermin.

Proposed Future Plans

1. The formation of a collective self reliant network of organisations involved in the development of traditional systems of medicine at the national and the global space.
2. The development of an information network through this formation to provide for an easy flow and access to available information and the systematic development of information that has hitherto been ignored especially in the area of the political dimensions of the development of traditional systems of medicine, and their exchange.
3. Establishing linkages with similar networks elsewhere with those involved in development alternatives to initiate a process of dialogue to develop strategies and approaches, mechanisms and code of conduct, and

programs of action in the area of traditional systems of medicine.

4. To consolidate the above through the implementation of a project to analyse and develop the building blocks for alternative development strategies for the traditional systems of medicine which would form the guidelines for action at the global, national and local space. Naturally, this would define in an objective way the development problematic in a wider perspective and provide wider areas for concerted, coordinated and sustained action through the dialectics of confrontations and negotiations.

The Survival of Traditional Medicine is linked with the existence of cultural and biological diversity of Indian Communities.

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Millions of Raindrops: Traditional of Water Conservation in Rajasthan

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Abstract of the paper to be presented in Hindi

The geography of Rajasthan is challenging, to put it lightly.

Firstly, it has been understood as the land where the sun hardly ever seems to go down. Geography books describe the region as hot and arid, with little rainfall. Temperatures touch 50° degree C in the summer. Home to the Great Indian Thar Desert, water appears to be a rare commodity! Adding to this gloomy picture is the general remark that groundwater is also scarce, being usually available at great depths of more than 300-400 ft average and being largely saline.

Rajasthan is indeed a blessed land, for its people have nurtured and sustained rich and varied institutions and traditions of rain-water harvesting and water management to meet all their needs so much so, that the divine boon became synonymous with the resourcefulness, the ability and the skill of the people which did not allow even a drop of water to go waste! What about the modern boons? One such example is the case of the Rajasthan canal; where the idea was to grant the boon of unlimited water to the remotest corners of Rajasthan and to establish piped water supply, where taps were to be a new phenomenon! But the boon has slowly turned into a curse for most of its water-logged *command areas*; Yet saving graces exist.

Today there are 515 villages in Jaisalmer, out of which 462 are populated, 53 lie deserted. Except for one village, all the other 514 villages there are evidences of water availability). According to a State Report, 99.787% of Jaisalmer's villages have their own water resources, wells, baories, tankas, talaabs.

In contrast to this basic requirement, and its fulfillment, are other contemporary indicators of social and economic growth whose figures are far from satisfactory -- out of the 515 villages, only 19% are connected by modern roads; post and telegraph services cover just 30%, while medical facilities run low at only 9% and electricity even lower at 4-5%.

Yet 99.8% of the villages have adequate water resources, all of which have been cultivated and maintained by the people themselves!

And so, where the modern state of numbers and statistics seems to be barren, and the shortages of contemporary indicators loom large, these life-support systems -- kuians, kunds, tankas, baoris, talaabs -- have been the lifelines of life and prosperity in the middle of the desert. They have withstood the test of time and change to become symbolic of the philosophy that not only links the past to the present but also harbours the potential to make the future like the past!

Agriculture: Past, Present & Future

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Abstract of the paper to be presented in Tamil

India is one of the countries which has been practicing agriculture for several centuries. Agriculture that was practiced in Ancient India was not a commercial activity. It was a way of life. Seed varieties were chosen based on the climatic conditions and rainfall pattern. A cordial relationship existed amongst the agricultural labourers and the landowners. Agriculture that was practiced in the past was strongly based on environment friendly principles. It did not violate the rules of nature.

I refer to the past great revolution agriculture when I talk about Agriculture of the present. To increase the yields several high yielding varieties were introduced. The yields increased initially and our granaries were full. However it was soon realised that one could not maintain these yields for long. The inputs required for cultivating the high yielding varieties were extremely high. Besides the chemical fertilizers and pesticides that were used caused a lot of environmental problems. Pest also developed resistance to pesticides and cultivation of sev-

eral crops had to be given up because of uncontrollable pest problem. The problems of chemical based agriculture is such that today several farmers want to give up this profession. What is the remedy for this let us think.

In countries like Holland and Israel farming is done with the help of Green houses and computers. In these countries they are also aiming for minimal labour. However the situation in our country is different. Our country is gifted with natural resources and enormous manpower. Our planning should be in such a way that we make use of all these resources efficiently. Livestock can be the backbone of agriculture. Tomorrow's agriculture should be based on livestock. It is then possible to increase the productivity several times & also maintain the health condition of people. We could even feed above 100 crores. Let us aim for tomorrow's agriculture which brings prosperity & contentment. It should be made attractive enough that educated youngsters would be willing to take it up as a profession

Late Arrivals

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Orissa presents a wide variety of housing types and housing patterns having distinct characteristics in design, layout, decoration, make etc. reflecting the socio cultural life style and the aesthetic sense of the people of different regions. In rural areas of Orissa, dependency on traditional building materials is almost complete. The area specific characteristic in house construction has stemmed out of the socio-cultural habit, prevalent in a particular region, of topographic and climatic condition in that area and to a large extent, of the variety and extent of bio resources available in that particular materials. In Orissa, at present there is a remarkable transition in rural and urban housing. The varied house types and lay outs are subject to various kinds of pull and push and stand on a cross road. The design and lay out of houses vary from district to district. The functional facilities of the households are determined by con-

siderations of climatic factors, socio cultural needs and geographical situation. Tribal housing patterns have distinctive style and are entirely dependant on environmental factors. Ventilation facilities play a considerable role in creating a healthy living place. In different parts of the state, indigenous people have their own concept of ventilation. Housing in forest and deforested areas have their own problems. Various house development alternatives are being proposed and practiced by several NGOs. Locally available materials and traditional know how and expertise are the key to Orissa's housing problems. These will lead them to the height of psychological comfort and over all satisfaction. Then only the society at large will be able to provide them with Baikuntha Saman Ghar, houses which can be compared, according to Oriyan folklore, with the abode of Vishnu. The time has come to look back.

Preservation of Traditional Marathwada Architecture in Maharashtra

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Traditional architecture is part of local culture. In each area it has evolved over hundreds of years. It is in harmony with the local environment which in turn governs the lifestyle, resource, climate patterns etc. As a result, it is location specific. Hence, it is different in different parts of the world. In the urban areas of the world, however, the architecture has detached itself from the traditions. The urban architecture is what may be called modern architecture. Since it has little to do with the local factors there is little variation between that in one part of the world and the other. But things have changed a little in the rural area, especially in the third world countries.

People in the rural areas of the third world countries even today continue to live in harmony with the surrounding environment. They depend for most of their needs including housing on the local environment. As a result what they build continues to be sustainable unlike what their urban counterparts build. In addition, the traditional housing is a strength of the rural community since it is self sufficient in that regard. The houses are generally built using predominantly local materials either through self help, or through a combination of self help and skilled local artisan intervention. In other words, there is little or no dependence on the outside system or individuals for housing.

But in the recent decades in India, and elsewhere, there has been outside intervention in the rural housing scene. This has been in the form of housing for the poor and post disaster rehabilitation. In India, barring a few exceptions, this type of

construction has not been location specific. In other words the houses built under such programmes have been built with high amounts of use of non-local materials and skills. The house forms employed in this have little harmony with the local environment. The space planning has little to do with the local life style. These inappropriate interventions have been instrumental in creating aspirations in the community at large which are not sustainable. These processes also result in long term hardships to the people. Often, this disturbs the traditional housing process by shaking peoples' confidence in the traditional materials and skills. This, if continued in a particular area, could rob the community of its strength to take care of its housing needs.

Marathwada is one such community where such processes commenced during the post earthquake relief and rehabilitation programme. A rehabilitation programme of an unprecedented scale has been initiated by the government across thirteen districts of the state. The way the programme has been conceived, it has already done much damage to the traditional housing process. It is not only adversely affecting the ability of the community to house itself but also in the process it is robbing it of long term safety from the future quakes.

ASAG has taken up work in this area during the last two years to reduce this damage by identifying the weaknesses in the traditional house construction in the context of the increased seismic activity in the area. With the help of TARU of New Delhi and Prof. Arya it has also identified the ways to

strengthen the traditional haouses to ensure the safety of the most number of people in the area. ASAG has taken up information dissemination as well as training programmes to prepare the community stand on its own feet and depend as

less as possible on outside interventions. In the process, ASAG has advocated the use of the local materials and construction techniques, and also the local space planning.

Pot-11 Potters from Literature - Kuyavar Perungudi

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The intention of this short write-up is to shed some light on the customary habits and trades of the *Kuyavars*

In the ancient Tamil literature, the word *Ko* denotes the Kuyavars. This is brought out by the fact that the poets in those times say *Kalam Sei Kove: Kalam Sei Kove* in their poems. *Ve* in Tamil means mud and *Vetko* means the Kuyavar who works with the mud. The word *Ko* might have changed into *Kuyavan* after adding *An* suffix over the period of time and the feminine gender for Kuyavar in Tamil is *Kuyathi*.

In the *Sangam days* (beginning of Christian Era) there were no divisions along caste lines but divisions existed only based on a occupation a person practiced that is why the potters didn't care to hide their identity. On the contrary, they were proud of it. Various poets have gleefully sung songs in praise of the potters who expertise in their trade, in those days.

A few droplets are reproduced below

A brave lady who lost her warrior husband in the desert war requests the potter to make the vessel in such a way that she could also be accommodated in the urn meant for burying her husband, as was the practice in those days.

The poet Iyyur Mudavarr exclaims that the smoke billowing out from the potter's kiln may engulf the entire sky, but the fame of King Nedumavalavan who has attained eternity, is much greater and hence the potter's attempt to make an Urn for such a famed person is not an easy job and because of that

the poet asks the potter whether he can use the entire land mass as the potters wheel and the huge mountains as the mud required?

The poet Kovur Kilar visualises in a much grander way ! He says, *Like the mud on the potters wheel taking the shapes as visualised by the astute potter, this great country will also become amenable in the able hands of the Chola King Nalankilli.*

Some more examples will also be described during the presentation.

In the Coimbatore Dt. Annur town Manneswarar temple stone inscription, it is mentioned about the agreement of a potter who has to provide five begging bowls per month to the devotees who come to the temple, towards the interest for some money he borrowed from the bigwig of the town.

In the Acchalpuram temple stone inscription, the Chola King Kulothunga Chaturvedi Mangalathar's decision regarding the permission given to the potters who make vessels and lamps to wear a towel on their shoulder is noted. This sheds some light on the life of Medieval age potters. There are a number of stone inscriptions, available regarding the potters and they were considered as an indispensable part of the society in those days.

Pot-12 Potters and Potteries in Orissa

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Orissa popularly known as Kalinga is rich with many cultural and traditional heritages. With long stretching coastal belt, thousand and thousand hectares of forests and vast mineral resources, this State is glorified with multi-lingual inhabitants through different castes and creeds. As per 1991 census, the total population of the State is 3,16,59,736 out of which nearly 16% i.e. 51,29,332 belongs to scheduled caste and 22% i.e. 70,32,352 belongs to sceduled Tribe communities. With only a minority identified as literates, the rest of the population due socio-economic factors, are still striving hard to be literates.

It is no doubt a fact that Orissa is rapidly progressing in the field of agriculture, industrial set up, health, education through total literacy campaign and things like that. But inspite of such spectacular progress, the rural folk are still in the habit of adopting their own traditional works till date. For example, potters, black smiths and weavers are still continuing their own profession even if their earnings are too meagre. The reason behind such continuation is due to their belief that such professions are still having some ethical values. If we focus our attention on the potters and potteries in Orissa, it is noticed that approximately 5% of the total population of the state are belonging to potter communities who are living in different

places to spreading in 314 Blocks. In a recent survey conducted in that regard, it was revealed that about 0.5% of the potters were above the poverty line. But the rest are still earning their livelihood by following the same classical procedure like their forefathers as indicated below:

Wheel made up of wood of special type, clay collected from riverside, fire wood from local forest and above all total participation of the entire family members during the work period in preparing earthen vessels, pots, tiles, toys etc are the basic norm in the pottery work. This paper would give a detailed description about the potters' finance, marketing, etc in the pottery.

Pot-13

Potter's Community - Their Socio-Economic Status.

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Science & technologies always provide the means to meet the needs of society and the basic needs of the traditional artisans are social and economic needs, which vary widely and changes with the level of modernization and standard of living. The capacity of the community to absorb and to upgrade

themselves also depends upon the standard of living and their socio-economic status. It is therefore essential to view very deeply the present standard of living and the status of these potters to decide the strategy for the up-gradation of the socio-economic status and the age-old technology.

Pot-14

Potters: Beware of Social Service Organisations

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Recently in *India Today* Magazine, an article appeared on the activities of a social service organisation trying to uplift the down trodden potters in a small Kerala village. The way of presentation has agitated the potters community very much.

The Social Service Organisation has taken great efforts to introduce new methods of working, effective marketing etc. to create great employment opportunities and thereby increasing the living standards of the potters. While explaining their original plight of life, the article said, due to poverty all ladies have taken to prostitution. This is highly unwanted comment and this has hurt the feelings of the community. This has cast a black shadow on the community. To boost up the results of the social service organisation, the author of the article has chosen to place community standards at a low level. The particular social service organisation, instead of boosting the morale of the community, has caused great injustice to the entire society.

Generally, chastity is placed in high position in all communities in India and still the same feeling is continued. Particularly the potters communities throw too much importance to it. In the early part of this century, cases have been reported of social boycott over such cases. In one case, the affected lady was pushed down in the Cauvery floods by a group of elders of the community including close relatives.

The stories of the great saint Thiruneelakandar and Kora Kumber expresses the greatness of their control over sex. During their younger days, they lived with their wives without sex, which were later exposed by Lord Siva and Lord Krishna.

The attention of the Conference is drawn to the unhealthy articles appearing in papers casting shadow on the image of the community causing heavy aspirations on the hearts of the community people.

Tex-13

Short History of Sourashtras in Tamil Nadu

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The State of Sourashtra was one among the 56 states in ancient India.

The people living in that part were known as the Sourashtras as is the case with Rajasthanees, Gujaratees, Marwadis, Marathas, Andhras, etc.

As history goes, Mohamed Gazini on hearing the prosperity and wealth of the region invaded it several times and plundered the wealth and destroyed many temples, notable among them being Somanathapuram.

Perturbed by the frequent invasions, feeling insecure and unable to carry on their way of life and occupation peacefully these people migrated from their place of origin to more safer places in south. On their way, some groups stayed in Maharashtra, Andhra, Tamil Nadu, Kerala and Karnataka. Their migration began in the 11th century and continued till 16th century.

The language of the Sourashtras is Sourashtra, which originated from *souraseni* a dialect of Gujarathi. This language is a spoken language. It can be written in Devanagari script. But this is not followed.

In Tamil Nadu they live in more than 56 towns and villages notable among them being Madurai, Salem, Trichy, Madras, Tanjore, Dindugal, Palayamkottai, Pudukkottai, Kumbakonam, Ramnad, Kancheepuram, Walajapet, Ambur etc.

In other states they live in Tirupathi, Bangalore, Bombay, Cuddappah, Delhi and Ahamadabad.

Their main occupation is Handloom Weaving. They are born weavers. This weaving skill attracted the patronage of Kings and Queens. Thus Krishnadeva Rayar of Vijayanagar Empire, Achuthappa and Thirumalai Nayak of Madurai, Hyder Ali of Mysore, Maratha and Nayak rulers of Tanjore and Trichy, and the rulers of Trivancore, held them in high esteem and gave donations and kept them near to their palaces. Sourashtras endeared themselves by their loyalty and peaceful nature and

their wearving ability. They wove fine cloths worn by rulers and their families.

It is by their traditional skill in weaving silk cloths they are still called *Pattu Noolkarar*. Even today, National and State awards are won mostly by Sourashtras for distinction in weaving technique. Kumbakonam, Kancheepuram, Arni, Walajapet, Thanjavur, Paramakudi, Salem, Madurai besides some other villages are some of the places where handloom weaving is the main occupation of Sourashtras.

Even now their main occupation is handloom weaving. More fortunate among them are engaged in cotton, silk and jari trading, handloom cloth production, dyeing and colouring, chemical business connected with handloom weaving. Hence, most of them are economically backward.

In every place they live, they form a Sourashtra Sabha to look after the development and welfare activities of their community. There is one sabha at the Apex called *Sourashtra Madhaya Sabha*, comprising of elected representatives from all over Tamilnadu. The members thus elected in their turn elect President and other office bearers.

There are many committees to look after various affairs of the Sabha. Like education, industry, finance, handloom weaving, linguistics, women's welfare etc. The committee members are nominated by the Sourashtra Madhaya Sabha.

Tex-14

Exploitation of Dye Yielding Medicinal Plants

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The development of modern technologies during the past one and a half gave birth to numerous synthetic products of daily use including the drugs, cosmetics and the dyes. Ease of their use, fastness of action and minimal dosage made the synthetic drugs so much popular that they soon repalced the age old plant based tested traditional medicines from the global health science. Similarly, easy availability, quick dyeing process, production of standard and fast hues enabled the synthetic dyes to oust their natural counterparts from almost every field of the world of colours. However, within decades of the establishment of mushrooming chemical industries including those manufacturing and using the synthetic, cometics and dyes, man realised the hazards posed by the proucts and effluents of these industries. Besides, the ever increasing allergic, toxic and carcinogenic effects noticed on human body, they are also casuing great inbalance in the eco-system of our planet.

Today the denouncemtn of synthetic drug and dye industries, specially in developed countries, has resulted in curbing the manufacture and use of several of these stuffs and forced the environmental scientists to give the call, *Go back to the nature*. Therefore, in order to save our own self as well as our environment we must look forward for exploitation of user-friendly,

soul soothing as well as eco-friendly drugs, cosmetics and dyes which are derived from the natural sources.

Explotation of medicinally important dye-bearing plants for achievement of health and cure beside satisfying the aesthetic sense for colours will undoubtedly be an intelligent step because their cultivation followed by porcessing of the products will not only generate rural employment, clean the atmosphere from pollution and increase the overall biomass of the region, but in several cases wiil also make the waste land productive and increase the fertility of the normal soil. Many trees and shrubs such as *Aegle marmelos*, *Acacia arabica*, *Butea monosperma* and *Indigofera tinctoria* are reputed for their medicinal as well as dye-yielding components and grow well on alkaline soils. Also, there are numerous examples of such legumious plants which not only yield some drug or dyeing material but also imporve the fertility of the soil. There are also instances when the waste material of medicinal plants, say for example the rind of pomegranate, wall-nut or bel fruit etc are used as dyeing materials.

Nature has provided us with tremedous wealth of drug and dye manufacturing units in the form of plants which do not require

the services of trained technical personnel for their running and maintenance and which do not endanger our own well being or the well being of our colourful world but on the contrary are capable of safeguarding our interest in every respect in the form of protection of our eco-system, control on pollution and eradication of unemployment and poverty. Therefore, we should not become lazy and dependent on the man made sophisticated trouble shooting chemical factories and should not ruin ourself by our own hands. Instead we must utilise our full potential to be benefitted with the favours of nature by creating a heaven like atmosphere on this beautiful planet as long as we live on it.

The forest and agriculture departments in collaboration with the village panchayats can go a long way towards increasing the gross national income through exploitation of drug and dye yielding plants by growing these on waste lands. This can easily be done by way of allotment of waste land, provision of saplings and seeds of such plants on subsidised rates and helping the enterprising villagers with necessary extension services for successfully achieving the desired objectives.

Sourashtras have adopted themselves to the conditions in Tamilnadu and are living peacefully and are friendly with all other communities.

Tex-15

Native Varieties of Cotton and Natural Dyes in Nineteenth Century India: The Case of Northern Coromandel

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This paper focuses on a period when the textile economy of Northern Coromandel was flourishing under the hegemony of the English East India Company and attempts to answer three major questions.

Firstly, what were the native varieties of cotton and how they retained their viability in the region?

Secondly, how did the Company's policies effect the erosion of these native varieties by 1850s

Thirdly, what were the various kinds of local natural dyes that enabled the weaver of the region to cater to the demand for coloured and printed fabrics?

Cotton produced in the Northern Coromandel were essentially of two kinds: White Cotton and Brown Cotton. The modes of cultivation for both were essentially similar, the only major difference being that white cotton was always grown along with the grain like Kandulu and Paddy, while brown cotton was sown separately. Brown cotton was more expensive to grow so the cultivators were introduced to white variety.

As the quantity of cotton produced locally was inadequate, the shortfall had to be met by imports from outside. Another reason for imports was the non availability of cotton which were needed by weavers specialising in the production of particular kind of textiles.

Our analysis indicated that the Company as it strengthened its control over various aspects of the production processes, it required to increase the export of cotton to England, for it was required to meet the demand of British industrial capitalists.

Such an attempt by the Company necessitated to make incessant efforts for the introduction of new varieties of cotton cultivation, namely, Bourbon, Tinnevely and American from the beginning of the nineteenth century.

In the Northern Coromandel region a wide variety of dyes were used in producing many coloured and patterned textiles for which the region was famous. The most commonly used dyes were those produced from indigo and chay root and to a lesser extent, from Cochineal. The local varieties of chay root produced in Guntur district were mainly three kinds, namely Neeraytepalloo, Enakapalloo, and Yetampalloo. Neeraytepalloo was otherwise called jungle chayroot a spontaneous produce, nurtured by seasonal rains. The Enakapalloo variety, known as the potti or short chayroot was produced in the sandy soil of the coast, and required very careful cultivation. Yetumpalloo was the variety cultivated during the hot season that is between February and August.

An analysis of these native varieties of Cotton and Natural dyes during the period of early Colonial intervention will, therefore, be helpful in understanding the various mechanisms adopted by way the weavers of the region to cope with the raising market demand for their products. Another important point that emerges from this study is that once the State had intervened at the level of the production process, apparently through its revenue policies, the artisan has no option other than accepting the emerging new varieties. This process in the long run led to the loss of their traditional skills.

A Case study of Handloom Weavers in Gudekal Village of Yeemiganur Area in Andhra Pradesh

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The present paper attempts to construct a profile of the weaving communities in the Yemmiganur area Karnool district of Andhra Pradesh. The paper highlights the importance of an anthropological study to perceive different dimensions of the weaver's social structure, also their economic problems and

their mechanisms to overcome them. The paper is based on the empirical data collected through participant observation on the weaving communities in Gudekal village of Yemmiganur area in Andhra Pradesh.

Technology Selection and Mix for Sustainable Agriculture

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The technological success primarily depends upon cost, time, situation, demand and suitability. Traditional science based farming activities have shifted to modern agriculture with high levels of external inputs such as agrochemicals, hybrid genetic resources and fuel based mechanisation. Technology packages developed in the experimental stations are transferred through extension for adoption in the farmers field. Apart from economic cost and benefit, the social cost and benefit also need to be analysed on technology implementation. Very little attempt is made to find out the technological suitability as well as its superiority over the prevailing practices. As a result in recent years some of the negative ecological and social consequences of the high external input based modern farming technologies have made the researches to review the situation in terms of its sustainability.

Eco saving Agriculture and Less external inputs

Development workers and planners now looking for an environmental and social friendly development. In this context, technology assessment for its suitability in terms of farmers level of operation, resource base, environmental and social factors is emphasized with growing demands of population pressure, the modern science and technology is used for increasing production per unit area of land at the cost of high input and environment. Therefore, it is at this juncture the concept of eco saving agriculture with optimal use of inputs for maximum yield benefits is emphasized and a suitable strategy in this line needs to be developed.

Technology Selection: Traditional or Modern or Mix?

To develop a strategy in the above said line needs among other things technology screening and assessment for suitability and

selection. It is not that all blame should go to modern high input technologies and the credit goes to the traditional technology in maintaining sustainability. The reality is that global food security depends not only on raising global production, but on reducing distortions in the food structure of the world food market and shifting the focus of food production to food deficit countries, regions and households. The shifting of agricultural production will be sustainable only if the resource base is sustained, enhanced and where it has been diminished or destroyed, is restored.

From the above reality it is implied that synthesis of relevant technologies selected for aiming to keep production in face with global demand, optimal resource base use, eco sustainability and preservation for future is the need of this hour. To do this uphill task, the scientific community needs relevant information about the technology transition, resource bases of the farmers and his technical knowledge in farming and the knowledge embodied in the ancient literature for their synthesis into modern science and technologies. Since the success of indigenous technical knowledge is limited to the location specific and socio-economic conditions of the people, any attempt to generalise its application is warned and needs to be approached with thorough scientific enquiry and analysis. From the judicious selection and mix of relevant system specific technologies derived from the sources of indigenous technical knowledge system and modern high input technologies derived from the sources of indigenous technical knowledge system and modern high input technologies the concept of eco friendly and sustainable location specific farming can be put into practice which in turn expected to contribute for a well distributed production system meeting the global demand.

**Agr-52 A Framework for Incorporating Informal R&D into Formal R&D
for Rapid Adoption of Agricultural Technologies**

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Undoubtedly, the formal research and development (FR&D) has made immense progress since last three decades or so in our country in increasing production and productivity, but limited to well endowed areas and resource-rich farmers. The developmental benefits, however, have not percolated down to the resource poor farmers who in adverse situation are still disadvantaged. Personal and system bias in generating technologies through FR&D, cost intensive implications and sometimes over use of production requisites, has resulted in unanticipated consequences in terms of agro-ecological disequilibrium and many now realised and believe that it is causing a threat to sustainable agricultural development. Thus, issues have come to dwell on the question of "progress from within the society and its implications".

A close look at many of technologies and methods generated through Informal Research and Development (InFR&D) indicates that majority of these are technically sound, less cost intensive, simple and easy to understand and apply, easily accessible and sustainable more particularly under unfavourable conditions. There is a need for careful critical understand-

ing and blending of technologies with open mind from the both sides viz researcher, planner and user to integrate the approach of both system (FR&D and InFR&D) for sustainable agricultural productions. Methodological intervention therefore assumes importance to incorporate both formal and informal R&D for rapid adoption of agricultural technologies by rural masses. Methodological framework include the de-illusionment and fallacies in FR&D and its utilization, options and issues for InFR&D. An exhaustive description of framework of integrating both the research system, and its elements, gives a new insight by citing and illustrating few relevant examples in generation of appropriate technologies and assigning research priorities for rapid and sustainable agricultural development. Some of the appropriate approaches of detecting the outcomes of InFR&D, rationale of their use, proven efficacy of technologies, procedure of its experimentation and validation and transformation to these in broader perspectives are the important considerations which would serve as a base to FR&D for blending the technologies to make it more compatible, sustainable and cost effective for wider use.

**Agr-53 Development of Agricultural Tools for Small and Marginal
Farmers of a Tribal Region in Bihar**

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Warning signal of accelerating growth of population in India calls for immediate increase in agricultural production. Poor investment capacity of the farmers and low price of agriculture production as compared to industrial goods stands in the way to heavy investment as well as talents to agriculture. In addition, a lack of institutional set up in the field of rural technology is another major handicap to promote agriculture production. It is, however, heartening to note that this important and essential issue creates now-a-days a rousing interest in the developing countries including India.

During the recent years, significant increase in agriculture production has been achieved in India through many avenues like use of better seeds, enrichment of soil by fertilisers and fair irrigation system. However, it is most surprising that comparatively less attention has been paid on improvement of agricultural tools. Now a time has come to fill up the gap between the rising growth of population and comparatively lower rate of agriculture production. Considerable increase in agriculture production can be achieved by the use of better tools and implements. Better tools provide ease and comfort in operation and thus increase the production capacity. Any at-

tempt to meet these requirements, demand adequate supply of proper grade of material. Considerable research work at the National Metallurgical Laboratory has proved the utility of improved agricultural tools in Indian farming.

National Metallurgical Laboratory, in association with Vikas Bharati, a voluntary field agency of Ranchi, was closely associated with the agricultural tools development programme in a backward tribal region of Bihar. Various problems regarding raw materials, education in connection with forging, design of equipments and their proper heat-treatment were solved through active interaction between NML and Vikas Bharati. The artisans of that region were given education and training of appropriate technologies required for the production of tools of their requirements. Some of the tools developed and produced will be shown as figures.

Investigation on quality assessment of different types of spades produced at various parts of Bihar were also investigated in regards to material composition, hardness, microstructure, heat-treatment and wear-property. The results of mechanical and abrasion tests revealed that the spades made of 0.5 to 0.6%

steel in quenched and tempered condition possess the best properties and are most suitable for agricultural applications.

Another important phase of work carried out at NML was the development of an improved material for plough share. A survey in some of the villages of Bihar and West Bengal revealed that the plough shares used by the farmer of those villages are made of mild steel. As a result, the plough shares wear out very fast requiring frequent sharpening or replacement. The problem of fast wear has been solved by replacing mild-steel with low-alloy cast iron using cheaper alloying

elements (Chromium and Manganese). This was established by measuring the wear loss of the developed material in the Laboratory as well as by field trials. The wear-test showed that the wear loss is at par with the IS recommended material C75 (IS 1570-1961) and exhibited life-span five times more than that of mild steel presently in use. The developed material also eliminates the additional farming and heat-treatment operations required by the IS specified alloy for achieving similar property.

Agr-54 Traditional Organic Homestead Farming in the Midlands of Kerala: An Eco-Economic Retrospection

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The paper attempts a retrospection of the traditional homestead farming systems of the midlands of the Kerala. The cropping and cultural patterns of certain regions in Kottayam-district which are representatives of the midlands in general, will be described and discussed. These cropping patterns were generally prevailing in the above areas till recently, i.e till the large scale adaptation of extensive monocultures of rubber and coconut (mostly rubber) which is posing serious threats to ecological balance and food security. Relatively similar systems are still existing throughout Kerala in limited numbers with some differences in crop intensity and crop diversity. The recent focus on cash income/cash crops has significantly altered these farming systems.

The state of Kerala is broadly divided into three parts viz. Coastal areas, Midlands (between 50-300 meters) and High ranges. These three broader geological regions used to follow markedly different cropping patterns, and associated life styles, despite visible threads of uniformity which were always present in the practice of agriculture. Out of these, agriculture systems in midlands deserve special attention because of their certain special features, which can contribute a lot in developing sustainable agriculture systems.

The pattern of farming is unique in Kerala owing to its extended village structure. Each individual house is surrounded by its own farm/garden. The homestead farming systems of midlands can be characterized by their high species index, high ecological stability, low external inputs, optimum biological productivity, total dependence on biological dynamics (contrary to the asphalt agronomy) for viability optimisation, distribution income availability, optimum utilisation of solar radiation and moisture, high organic matter (humus) content, high capacity to retain rainwater and prevent erosion, relatively high economic returns and self sufficiency. These systems helped people in realizing the best from the bountiful nature, sustainably.

These systems are essentially equivalent to the agro-sylvi-pastoral systems in the modern terminology. Generally animals and birds were part of this agriculture with their inevitable roles. People practiced multi tier (some time up to 5 tiers) cropping system and planted diverse variety of plants, to cater, food, social, medicinal, aesthetic, religious/cultural needs. Combining bovine, ovine, piggery and poultry wealth made the system more efficient. The farming system provided enough to meet their food and shelter needs. The crops included tree crops for food, oil and timber, including spices like nutmeg and clove, fruit trees like jackfruit, papaya, mango, custard apple etc. Other fruit crops were tubers, a variety of them, including cassava, taro, variety of yams, some of which are creepers, some ground covers etc. Apart from these various pulses and grains and vegetables were also found. The biomass residues and grass and tree leaves were fed to animals and recycled. Pigs were last in this chain, recycling the last level of wastes including human excreta, making the recycling almost complete. Most of the medicinal plants for day to day needs also were generally introduced in these systems. In short a well maintained homestead farm was designed to meet a considerable number of day to day functions.

In the parlance of modern organic agriculture, these systems would be referred to as Permaculture System or Bio-Dynamic Farming and are in many ways much more closer to Natural Farming principles. It is quite interesting to observe that before most of these terminologies developed and copyrights/patents taken, such systems had been over time naturally evolved by the average farmers. The indigenous knowledge of properties of plant and animal species, along with an understanding of the complexity and complementarity in natural systems helped people in developing sustainable agricultural systems. This is going to be relevant in the period when the sustainability of agriculture in these areas are being questioned, and food security undermined. The proposed paper will be describing this system in detail, and assessment from the perspective of sustainability will be attempted.

(Based on a recent pilot study by the author conducted in these regions. The information was collected informally, mostly relying on the farmers memory)

Agr-55

Eco-logic

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Eco-logic or logic of ecology has been evolved through natural observations and contemplation over an extended period of time. In essence, this says that *each organism has a role* and builds up the population to match the task presented to the organism.

Organisms that have a permanent role maintain a steady population. They have a small growth rate to match senescence and death. These organisms are either silent or pleasant in their activities. These are the K-selected organisms as they are popularly known in ecology. Earthworm, cow, man, etc. are the K-selected organisms.

Other organisms that have a transient role, have a short life span and have a high growth rate to enable them build up their population when needed. They execute their tasks and crash their population. Bacteria are so diverse and fast and each species have a transient role. Most of the other organisms that

belong to this category are crisis managers such as fungi, anaerobic bacteria, protozoa, nematodes, aquatic animals and pests. They act as biosensors, bioindicators and biocontrol agents of crisis. Pests do cause variable nuisance so as to warn us about the crisis situation. They can be effectively controlled only by avoiding the crisis situation.

The latter group of organisms are termed as r-selected in ecology. Redworms (such as *Eisenia foetida*), rats, cockroaches, flies, ants, mosquitoes and other crisis managers are visible and may cause nuisance. They also have high breeding power and mobility because they consume the overload of organic food (that would otherwise create toxicity) and disperse to die on a wider area.

It is necessary to read these signals and take appropriate steps to remediate the crisis. Killing the crisis managers with chemical weapons is not an eco-logical approach.

Agr-56

Organic Waste Processing Via Vermiculture - A Slide Show

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Human and animal habitation generate large quantities of organic wastes. Traditionally these wastes were returned to land to serve as energy and substrate for soil bioprocesses.

In urban areas space is at a premium and often space required for organic waste processing becomes difficult to find. As a result, this valuable organic waste resource is dumped on land and water bodies and becomes a problem leading to much disturbance of our land and waterways.

Current day organic waste processing technologies accomplish the waste disposal either by incinerating the waste chemically or biologically and thus dissipate the energy value in these wastes. In such treatment processes residues are generated which often pose greater problem for their disposal.

In this slide show we present a solution to these problems. Here we overview the technology of organic waste processing using vermiculture ecosystem consisting of soil, soil bacteria, earthworms, plant roots, rock particle and bioindicators such as flies, insects, rats etc. In this process organic wastes are used to drive soil processes. The biocarbon energy is used for generation of plant nutrients from rock particles, fixation of nitrogen from air and production of other metabolites and products which are assimilated by plants. The soil bacteria

perform these waste processing functions while earthworms are implicated in regulating these soil processes. The bioindicators such as flies indicate overloading of protein wastes leading to alkaline pH while insects, rats etc. indicate overloading of carbonaceous wastes leading to acidic pH. Thus the health of a vermiculture process at work can be gauged from the type of bioindicators.

Vermiculture ecosystem can be used to process organic wastewater, for soil/ land rejuvenation and for processing organic solid wastes. This slide show captures the process of converting organic solid waste into biofertilizer using vermiculture. Here wastes are processed over a chosen cultured, landscaped area at the rates ranging from 0.5- 2.5 kg/m².d. This rate depends on the quality of the soil on which the process is to be implemented. The sprinkling of additives at predetermined rate is practiced to regulate the bioconversion. Results indicate typically requirement of additive is 2 - 3kg/kg dry organic matter and product varies from 3 - 4kg/kg dry matter in waste.

A number of projects have been setup in the last few years for household wastes (15kg/d), eating houses of industrial establishments(400kg/d.), hostel canteens (1000kg/d), farm residues(500kg/d.), market wastes of corporations(100 tons/d.). Investments vary depending on site conditions. The major

running costs are water, additives, manpower and operating costs.

The results indicate that system is fairly immune to shock loads. The vermiculture ecosystem provides an aesthetic and pleasing environment in sharp contrast to insanitarily environment normally found in dumping grounds and public conveyances and disposal sites.

The biofertilizer product from the above activities is used in horticulture and wasteland development. A number of applications for biofertilizer product in vegetables, sugar cane farming are presented to bring out the efficiency of the product.

The presentation will also cover the experience of farmers in internal recycling of farm organic waste to bring out the benefits of such recycling.

For-19 People's Knowledge of Forest Biodiversity

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Phansad wild life sanctuary from Raighad district hosts a mosaic of various forest pockets differing in topography, human impacts and in turn, species composition and age. This study traces the history and current trends of exploitation and conservation of forest wealth with reference to two commu-

nities of local people vis-a-vis commercial, government and other external forces. The need for subsistence exploitation is emphasised for conservation of biodiversity and welfare of local people. The picture will get brighter by wisely utilizing rather than caging forest resources.

For-20 People's Knowledge of Forest Biodiversity

Parvati Menon

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Pappara wildlife sanctuary at the foot hills of Agasthya malai district is rich in forest biodiversity and 'Kani' tribals well known for their deep ethnobiological knowledge. Acquaintance and sharing information with this secretive tribal com-

munity is a challenging task. Here is a study of forest tribals' knowhow vis-a-vis scientists, environmentalists, government and commercial forces. The situation is made but not out of hands.

Wtr-19 Technologies of Traditional Tank Structures

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Tanks are the earliest human innovative indigenous rain harvesting structures, designed and created by our ancestors to serve the community in one way or other.

Different indigenous technologies had been adopted by our ancestors in the formation of tanks and its appurtenant works, like tank bund, sluice water weir etc., suiting to different geo-physical features. These indigenous systems serve even to-day while many of the newly constructed tanks in the recent past are unable to serve efficiently.

This paper tries to list out some of the technological advancements made in the matter of tank construction at different points of time due to the advancement of human knowledge and also the devoted involvement of our ancestors and the meticulous thoughts, bestowed by them in every aspect of tank construction. The famous 'Porumamilla' tank inscription of 1291 of Cuddappah District in Andhra Pradesh stipulates certain dos and don'ts in the matter of selection of tanks.

They are

Criteria for tank selection

i) It should be in a valley between two hills and are to be built with compact material. (ii) Other than hilly tracts it should be one of impermeable clay to arrest deep percolation. (iii) Soil should be good to raise crops. (iv) Tank locations should be near streams to have good water flow. (v) Knowledgeable persons, in Pathas Sastra and Jala Sastra are to be associated in the construction of tanks.

Likewise six Doshas or defects were identified.

They are

(i) Water coming from the Dam (Bund). Porous materials should not be used for bund construction. (ii) Soil should not be saline. (iii) Tanks in state boundaries discouraged on security reasons. (iv) Ridge (Kurma) in the middle not recommended (v) Scanty supply of water and extensive stretch of

land (vi) Scanty ground and excess of water.

Both items (v) and (vi) emphasise the need to balance the extent of storage and service area of a tank command to get optimum benefit.

Sluices

Over a period of time various types of water drawing sluice arrangements had been resorted to in accordance with the advancement of knowledge and technological developments.

It spans from open cut palmyrah spouts sluices to the present R.C.C. hume pipe sluice barrels for sluice conduits. Likewise various transformations had taken place both in the sluice cistern arrangements, as well as the water regulating arrangements. It ranges from the Pulikan Madai to the present Tower Head sluices. From the uncontrolled drawal pattern of open cut arrangements, fine tuned plug rod water regulating devices were evolved.

Waste Weirs

Here also tradition had perfected different types of waste weirs to dispose the flood flows suiting to different geo-climatical conditions. It spans from the natural ground escape (NGE) to the multi functional calingullah type of weir. It serves (a) as Surplus weir (b) Water sharing device in the case of chain or group of tanks (c) A flood moderating structure at time of heavy rains.

The efforts put forth by our ancestors and the technologies adopted by them in the matter of selection of tank sites, construction of tanks were of high order which are ever lasting. Even to-day viable alternatives could not be thought of, for sluice plugs and calingualas.

As such, the concern should be, how to protect and preserve these time tested old monuments of tank structures from disappearance on the name of improvements.

Wtr-20

Traditional Water Distribution Practice and Changes in the Present Context

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Introduction

Sowdarpatti Karisalkulam tank is located in the black soil area of the state in Thirumangalam Taluk of Madurai District. It is a non system rainfed tank and receives water from its own catchment of 7.00 sgkm and from nearby Gounda Nathi through a supply channel. The average annual rainfall is about 920mm. The total capacity of the tank is 32.31 mcft and its present capacity is only 26mcft because of heavy siltation. It has got 4 sluices and serves a common area of 127.58 ha. It is a village with five hamlets where in more than 8 caste group people are living.

This paper tries to focus the dominant role of village leadership on tank system management in ancient days and the traditional water distribution practices resorted to and also the efforts put forth currently in retrieving the traditional water management practices suiting to the current thinking of water management concepts and its impact.

Traditional Water Distribution practice

Brahmins were the dominant land owing caste earlier and one Ramasamy Iyer was the powerful village leader. Hamlet leaders respected him.

Maintenance works like channel cleaning, supply channel cleaning, closing breaches were carried out under the direction of the village leaders through community's participation.

Water distribution to the individual fields were looked after by the Neerpatchies under the supervisions of Neerkattis.

Individual farmers were not permitted to do this job. Conflicts emerged in sharing of the tank water were resolved by the hamlet leaders. The village leader Mr. Ramasamy Iyer's decision on such matters was final. The success of the arrangement were due to

i) Unquestionable and respected village leadership ii) Dedicated hamlet leaders iii) Democratic decision making process iv) Cordinal relationship between hamlets v) Less number of land owners.

Consequent to the changes in the administrative set up after independence, large scale land transformation had taken place. After passing away of the village leader Mr. Ramasamy Iyer the traditional practices started to disappear.

Revival efforts

Efforts to revive the traditional system were put forth by the C.W.R. research team in this tank as it happens to be one of the study tanks on participatory irrigation management.

Disorganised community had been organised into a Water Users Association. The Neerpatchi system had been renewed through the W.U.A. by appointing Neerpatchis from the traditional families. They were paid in kind.

The W.U.A. took up the responsibility of water distribution through the Neerpatchies and Neerkattis as it were earlier. This arrangements were tried during the crop season 1994-95.

The outcome of the efforts will be discussed during the presentation.

Fsh-12 Fishermen's Knowledge of Wind Direction and water current

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During monsoon, the wind blows mostly from the south-west.

Wind and water current are inter-related. It is difficult to identify whether, this takes place either from sea to shore or from shore to sea. Even though the elder fishermen have no knowledge about astronomy, they can very well predict the nature of the rain and water current by analysing the direction of the wind. Even by watching the clouds they can predict the water current in the sea too.

Water-Current

During certain periods of occurrence of water-currents, the colour of the sea will look like troubled water. Sometime the Water will be clear. By watching this, the fishermen can predict

whether the catch will be abundant or not. During certain periods though there are plenty of fish it cannot be caught by using net by fishermen. Rarely, water bubbles used to come up from the bottom of the sea. By watching this, they can predict whether sea is rough or soft. During certain seasons sea-snakes can be seen at water surface. In such seasons dolphins used to come close to the sea tides, and certain ray fishes are abundantly caught by the country boats. These symptoms help the fishermen to foresee whether the sea is rough or soft. Very often it occurs so. Even by hearing the sound of the sea tide, they can predict the above climatic changes. Thus the fishermen are well-versed in the field of oceanography.

Fsh-13 Fish Habitats: Life Blood of Marine Eco-System

Andrews.A. Kollam
PCO, Trivandrum

In the inshore waters of Kerala coast especially in Calicut Region Natural fish habitats formed of rock stones are seen. The artisanal fishermen have given names to all the natural fish habitats seen between one and eleven fathoms from Quilon and Jaffna in the North-South direction. They are like small mountain inside the sea. To identify the exact position of the habitats,

the fishermen used the shore identities (buildings, trees, lights etc.). The artisanal fishermen are of the view that such habitats formed of rocks are growing. Traditionally it is stated that such habitats were once the buildings, forts and churches erected by the Portuguese and Dutch. Such habitats became asylum of more than 250 species of fishes.

Hlt-72 Disease Causation and Cure in Indigenous Community with Reference to Magico - Religious Practice and Herbal Medicine

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Medicine and disease have had an undeniable effect on the history and culture of mankind. Researchers in developed countries have found that they have much to learn from traditional medicine. Formerly, however they had been viewed as inefficient and downright destructive, which they are not so, any more.

Therefore, while treating patients, the man wisely take into consideration, the area, constitution, time, appetite, the psychological set up and the age - where these factors are similar to the principle adamberated in Ayurvedic medicine.

Bahu kalpam Bahu Gunam Sampannam Yogyam Aowshadham
- *Sushruta Samhita*

The efficacy of medicine depends on its capacity to cure many conditions according to its signs and symptoms of the diseases, which in turn depends on the Rasa, Virya and Vipaka.

Here, an attempt is also made to probe into the relevance of indigenous curative practices which is transferred orally from one generation to other and Ayurveda which has a system of its own.

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மரபுசார் மனைக் கட்டிடப்பணிகளும், இக்காலச் சிற்பிகளும்

T.N. அகோர ஸ்தபதியார்,

பூம்புகார் - 609 107.

வாஸ்து கலை என்றும், சிற்பக் கலை என்றும், கட்டிடக் கலை என்றும் பல பெயர்களில் சொல்லப்பட்டு வரும் மரபுசார் கலைப் பணியானது வீட்டுக் கட்டிடத்தையும், வீடு கட்டும் பணியையும் குறிப்பிடும் ஒரு பொருள் குறித்த பல சொற்களாகும். வாஸ்து என்ற சொல் ஒரு பொதுச் சொல் என்று கூறலாம்.

உலகத்தில் காணப்படும் உயிரினங்களைக்கூட வாஸ்து, வாஸ்து என்ற சொல்லால் தான் பண்டைக் காலத்தில் சிற்பிகள் சொல்லி வந்தார்கள். இன்றுகூட வாஸ்து என்ற சொல் எப்பொருளையும் குறிப்பிடும் பொதுச் சொல்லாகத்தானே இருக்கிறது! அதையே சிற்பம் என்றும் சொன்னார்கள்.

வீட்டை உயிர்ப் பொருளாக சிற்பிகள் (ஒருவித கணக்கைக் கொண்டு) படைப்பதால் வீட்டையும் வாஸ்து என்றே சொன்னார்கள்.

மனிதன் தொல் பழங்காலத்தில் மரத்தடியிலும், குகைகளிலும் வாழ்ந்து வந்தான். அக்காலத்தில் அவன் இயற்கையோடு இயற்கையாய் வாழ்ந்திடும் வாய்ப்பைப் பெற்றிருந்தான். இயற்கையின் ஒரு கூறாகவும் அவன் விளங்கினான்; அங்ஙனமே அவனும் உணர்ந்தான். அதன் பயனாய் தன்னையும் தன்னையொத்த இயற்கையின் புறச்சலனங்களையும் அக நுட்பங்களையும் நேரடியாகவும், அகத்துக்குள்ளேயும் அனுபவிக்கும் சந்தர்ப்பம் அவனுக்கு நிரம்ப இருந்தது என்றால் மிகையாகாது.

இந்தச் சூழ்நிலையில் தான் நமது வேதங்கள், ஞானநூல்கள் மற்றும் விஞ்ஞான நூல்கள் பிறந்தன என்று இங்கே சொல்ல விரும்புகிறேன். அத்தகைய நேரத்தில் இயற்கையைப் பற்றிப் பேசிய நுட்பங்களைத் தான் இன்று அறிஞர்கள் ஆராய்ச்சி செய்யும் பொருள்களாக வைத்துக் கொண்டிருக்கிறார்கள். இங்ஙனம் உண்டா இல்லையா என்பதை நீங்களே நினைத்துப் பாருங்கள். இந்த நேரத்தில் தான் ஆன்மீக உணர்வுகளும் இயற்கையின் புறத்தைப் பற்றிய நுட்பங்களும் தெளிவாக இருந்தன என்றும் சொல்லலாம்.

இத்தகைய சூழ்நிலையை விட்டு மனிதன் எப்போது தன்னைத் தனிமைப்படுத்திக் கொள்ள முயற்சித்தானோ எப்போது வீடு கட்டி ஒதுங்கி வாழ முயற்சித்தானோ, எப்போது தனிக் குடித்தனம் செய்ய முற்பட்டானோ அப்போதுதான் அவன் செயற்கைச் சூழலின் ஆளுகைக்கு உட்பட நேர்ந்தது என்று சொல்லாம். மண்ணாலும், செங்கல்லாலும் சுவர்களைக் கட்டிக் கொண்டு அதன் மீது கூரை ஒன்றை எழுப்பிக் கொண்டு, இயற்கையை விட்டுப் பிரிந்து தனித்து வாழ முயற்சித்த காலத்தில் கட்டிடக் கலைப் பிறந்தது என்றும் சொல்ல

லாம். வெய்யில், மழை, காற்று ஆகியவற்றிலிருந்தும் விலங்கினங்கள், பூச்சிகள் போன்ற உயிரினங்களின் தொல்லைகளிலிருந்தும், அபாயங்களிலிருந்தும் தன்னைப் பாதுகாத்துக் கொள்ள மேலும் தனது சிந்தனைகளை முடுக்கி அவற்றை ஓரளவு வெற்றிக் கொண்டான் என்றும் சொல்லலாம்.

அதன்பிறகு கட்டப்படும் கட்டிடம் பலர் சேர்ந்து வாழும் பெரிய குடிலாக இருந்தது. அமைத்திட வேண்டிய நேரமும் அவனை எதிர்கொண்டது. எனவே, சிறிய, பெரிய குடில்கள் தோன்றின. இத்தகைய எண்ணம் தோன்றி, செயல் தோன்றி ஒதுக்கிடம் அமைத்துக் கொண்ட அதே சமயத்தில் வேறு சில உணர்ச்சிகளும் அவனுக்கு ஏற்பட்டன. தன் இருக்கையை அணி பெற அமைத்துக் கொண்டான். இருப்பினும் இந்தப் புதிய சூழ்நிலையில் பல இடுக்கண்களும், உடல் நலிவுகளும், அமைதியின்மையும் ஏற்படுவதைக் கண்ட மனிதன் தன்னை ஆராய்ச்சியாளனாக மாற்றிக் கொள்ள நேர்ந்தது.

இங்ஙனம் இட வசதியும், அழகிய தோற்றமும் கொண்டு விளங்கிய அந்த மனைகள் உள்ளத்திற்கு அமைதி தரும் இடமாக இல்லை என்பதை அனுபவித்த மனிதன் மேலும் செய்த சிந்தனையின் விளைவே வாஸ்து சாஸ்திரம் என்ற பெயரில் நிலவுகிறது.

வாஸ்து சாஸ்திரங்கள் சொல்லுகின்ற முறைப்படி மனைகளைச் செய்திடும் காலத்தில் செடிகள், கொடிகள், மரங்கள், பறவைகள், விலங்குகள் ஆகியவற்றை மனித வாழ்க்கைக்கு அத்தியாவசியமானவை என்று பகுத்தறிந்து கொண்ட நேரத்தில் உள நிம்மதியோடு வாழ அந்த மனையிடம் எப்படி அமையவேண்டும்? எவ்வளவுகளில் அமையவேண்டும்? எத்திசை நோக்கி அமைய வேண்டும்? என்றெல்லாம் கணக்கிட்டு அகத்துக்க ஒத்த மனை இடங்களைக் கட்டிக் கொண்டு உடல்சுகம் மற்றும் ஆன்மசுகம் பெறும் மனை இடமாக மாற்றிக் கொள்ளும் நுட்பங்களைத்தான் வாஸ்து சாஸ்திர விதிகள் என்று சிற்பிகள் சொல்லுகிறார்கள்.

அங்ஙனம் மூவாயிரம், நாலாயிரம் ஆண்டு காலமாக இந்நாட்டுச் சிற்பிகள் மனைகளைப் பதைத்தார்கள், மாளிகைகளையும் கட்டினார்கள். மேலும் சொன்னால் வீடுகளையும், மாளிகைகளையும் கொண்ட கிராம நகரங்களையும் தோற்று வித்தார்கள். தாங்கள் கட்டிக் கொடுத்த இடங்களில் அமைதியையும், தெய்வீகச் சூழலையும் தங்கிடச் செய்து பரசுக வாழ்க்கையை இந்நிலவுலகிலே கிடைத்திடச் செய்தார்கள். அங்ஙனம் தோற்றுவித்து சமுதாய அங்கீகாரத்தையும், ஆதரவையும் இந்தச் சிற்பிகள் பெற்றிருந்தார்கள். சிற்பப் பணியாளர்களுக்கு வரிவிலக்கே செய்திருந்த செய்திகளை வரலாற்று ஆசிரியர்கள் கூறுவார்கள். அத்தகைய பணி, ஆதரவு மற்றும்

அங்கீகாரம் ஆங்கிலேயர்கள் காலத்தில் பிற்படுத்தப்பட்டு விட்டன. அதுமட்டுமல்ல, ஆண்டாண்டு காலமாக அனுபவித்து வந்த உரிமைகளும் பறிக்கப்பட்டு விட்டன. இந்த நாட்டில் வியத்தகு கட்டிடம் மற்றும் கலைப் பணிகளைச் செய்து இந்த நாட்டுக்குப் பெருமை சேர்த்திட்ட சிற்பிகளுக்கு தங்க இடமின்றி, பிழைத்திட உரிமையின்றி, பணியின்றி பட்டித் தொட்டிகளில் முடங்கி ஒடுங்கி ஒரு சிலரே இப்போது இருக்கிறார்கள் என்று சொன்னால் மிகையன்று.

இந்தச் சூழ்நிலையில் உடனடியாகச் செய்ய வேண்டிய காரியங்கள் பல இருக்கின்றன. அவை பின்வருமாறு:

1. வாஸ்து விதிமுறைகளின் படி வீடுகட்டினார் ஏற்படும் குண நலன்களை (தொலைக்காட்சிகள் மூலமாக) பட்டித் தொட்டிகளிலிருந்து பட்டணம் வரை பரப்பிடுவதை நமது அரசு ஒரு தலையாய பணியாகக் கொண்டிட வேண்டும். எதுபோல் என்றால்? பெண்ணுக்கு திருமண வயதை நிர்ணயித்து இப்போது ஆட்டோ ரிக்ஷா வரை விளம்பரம் செய்யப் படுகிறது அல்லவா அது போல என்பேன்.

2. இரண்டு போதும் என்று சொல்லி ஒன்றே போதும்

என்று பஸ்களிலும், லாரிகளிலும் விளம்பரம் செய்யப்படுகிறதே அவ்வழியை இதற்கும் பின்பற்றலாம்.

3. சிற்பிகளைக் கொண்டு அதன் நுட்படங்களைப் பொது மக்களுக்கு அளித்திடும் நோக்கில் கருத்தரங்குகள் நிகழ்த்திட அரசு நிதி உதவி செய்தல்.

4. விஞ்ஞான நுட்பங்களை உள்ளடக்கிய வாஸ்து நூல்களைத் தமிழிலும், ஆங்கிலத்திலும் எழுதிடத் தக்க ஏற்பாடு செய்தல்

5. வாஸ்து முறைப்படி வீடு மனைகள் ஆக்கித் தரும் சிற்பிகளை கண்டறிந்து அவர்களுக்கு ஊக்க ஊதியம் அளித்து இழந்து போன உரிமை மற்றும் ஆற்றலைப் புதுப்பித்தல்.

6. வாஸ்து ஞானத்தை புதுப்பித்துக் கொள்வதற்கு அரசுக் கல்லூரிகள் வழியாகவோ, தனியார் ஆய்வு நிலையங்கள் வழியாகவோ வசதி செய்து கொடுத்தல். உடனடியாக மேற்கண்ட பணிகளைக் கீழ்க்கண்ட அரசு செய்தலே இத்தகைய பணிகளுக்கு உறுதி அளித்திடும்.

தமிழ் - 2

தமிழகத்தில் இரும்புத் தொழில் ஒரு பாரம்பரியம் கே. சுப்பிரமணியம் ஆச்சாரி

(த/பெ. எஸ். குத்தாலிங்கம் ஆச்சாரி), (பரம்பரைக் கொல்லு வேலை)
படிப்பு : எஸ்.எஸ்.எல்.ஸி.

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10 நினைது நாகரீக வளர்ச்சியில் உலோக காலம் கற்காலத்திற்கு அடுத்தது என வரலாறுகள் கூறுகின்றன. ஏறத்தாழ 5,000 ஆண்டுகளுக்கு முன்பே உலோகங்களைப் பற்றி அறிந்து கொண்ட அவன், ஆயுதங்கள், வீட்டு உபயோகப் பொருள்கள் ஆகியவைகளை உலோகத்தால் செய்து கொண்டான் என அறிகிறோம். சிந்து சமவெளி அகழ்வாராய்ச்சியில் கிடைத்த எச்சங்களே இவ்வுண்மையைப் புலப்படுத்துகிறது.

“இரும்பைக் காய்ச்சி உருக்கிடுவீரே!
இயந்திரங்கள் பல செய்திடுவீரே!”

என்ற பாரதியின் பாடலுக்குப் பொருளாய் விளங்குபவர்கள் ஐந்தொழில்களில் ஒன்றான மனுத் தொழிலைச் செய்துவரும் கொல்லர்கள் என்ற விஸ்கர்ம மக்களே. “கரும்பொன்” என்ற பெருமைக்குரிய உலோகமான இரும்பின் பயனை இவ்வுலகம் அனுபவிக்கச் செய்தவர்கள் விஸ்வகர்மக் கொல்லர்களே.

தமிழ்நாட்டில் பல பகுதிகளில் சேலம், கோவை மற்றும் திருச்சி மாவட்டங்களில் தரமான இரும்பு மற்றும் உருக்கு தயாரிக்கப்பட்டதாக வெளிநாட்டவர் குறிப்பிட்டுள்ளனர்.

சேலம் மாவட்டம் கஞ்சமலைத் தொடரைச் சார்ந்த பகுதிகளில் இரும்புத் தாது (Iron ore) கிடைக்கிறது. சேலம் மாவட்டத்திலுள்ள நாமகிரிப்பேட்டை கொல்லர் மேடு, அரியாக்கவுண்டர் பட்டரை மேடு என வழங்கும் இடங்களில் தோண்டத் தோண்ட ஏராளமான “கோளான் கட்டிகள்” கிடைத்துக் கொண்டிருக்கின்றன. கோளான் கட்டிகள் என்பது மண்ணும், கல்லும் கலந்த இரும்பு மற்றும் உலோகக் கழிவுகள் (Slags), இவற்றைக் கொண்டு பார்க்கும்போது இந்தப் பகுதிகளுக்கு அருகில் எண்ணற்ற கொல்லர்கள் பணியாற்றிக் கொண்டிருந்த பெரும் தொழிற் கூடங்கள் இருந்திருக்க வேண்டுமெனத் தோன்றுகிறது. கலப்பை, களைக் கொத்தி, அரிவாள் முதலான உழவுக் கருவிகள் செய்ய பெரிய தொழிற்கூடங்கள் தேவையில்லை. ஒன்று அல்லது இரண்டு குடும்பங்களே போதும். பெரும் தொழிற் கூடங்கள் இருந்தனவென்றால், அங்கு அரசுக்குத் தேவையான போர்கருவிகளே தயார் செய்யப்பட்டிருக்க வேண்டும். இதனை ஆராய வேண்டிய பொறுப்பு நம் அறிஞர்களையே சாரும் என்று ஓய்வு பெற்ற சேலம் டிப்டி கலெக்டர் திரு. சண்முகம் அவர்கள் “விஸ்வகர்மா” என்ற புத்தகத்தில் கூறுகிறார்.

இரத்தினங்களைப் பற்றி ஒரு கண்ணோட்டம்

ஈ.கே.பிரேம்குமார்

சீங்க இலக்கியங்களில் பலவித அணிகலன்கள் பற்றிய குறிப்புகள் காணப்படுகின்றன. தமிழகத்தின் பண்டைய துறைமுகங்கள் ஆன கொற்கை, வஞ்சி, புகார், முசிறி... ஆகியவைகளில் கடல் கடந்து வந்த வணிகர்கள் தங்கள் நாட்டு இரத்தினங்களைக் கொடுத்து இங்கிருந்து இரத்தினங்களை பண்ட மாற்று முறையில் பெற்று கொண்டதாக வரலாறு கூறுகின்றன.

அணிகலன்கள் செய்யத் தொடங்கிய காலத்தில் இருந்து இன்று வரை அணிகலன் செய்வதையே தமது பரம்பரைத்

தொழிலாகக் கொண்டுள்ள விஸ்வகர்ம மக்கள் இரத்தினங்களை பற்றி நன்கு அறிந்தவர்கள் என்ற பெருமை பெற்றார்கள். ரத்தினங்களை தரம் பிரித்து காட்டுவதில் சிறந்தவராக விளங்கிய எனது காலம் சென்ற தந்தையார் திரு.மா. கந்தசாமி ஆச்சாரி அவர்கள் கூறி சென்ற சில விவரங்கள், என்னை மேலும் நவரத்தினத்தின் குணம் பற்றி தெரிந்து கொள்ள வேண்டும் என்ற ஆவலினால் பல நூல்களில் இருந்தும், பல நிபுணர்களிடம் இருந்தும் சேகரித்த சில விளக்கங்களை இந்தக் கட்டுரையில் கூற விழைகிறேன்.

பொன் அணிகலன்களும் பொற்பணியாளர்களும்

வி.என். கஜேந்திரன்,

ஐந்தியல் ஆய்வர்

வாஸ்து மரபு

நாகரிகத்தை நோக்கி அடி வைக்கும்போதே மனிதன் அணிகலன்களை அணியத் தொடங்கி விட்டதாக வரலாறுகள் கூறுகின்றன.

பெரும்பாலான அணிகலன்கள் பொன்னால்தான் செய்யப்படுகின்றன. ஏனெனில், உலோகங்களிலேயே பொன் தான் சுத்தமான உலோகம். துருப்பிடிப்பதில்லை. தன் பொலியையும் இழப்பதில்லை. மற்ற உலோகத்திலுள்ள இரசாயன மாற்றம் மனித உடலுக்குத் தீங்கு விளைவிக்கும். ஆனால், தங்கம் மனித உடலுக்குள் சென்றாலும் நன்மையே விளையும். பொன்னிற்குச் சில நோய்களைத் தீர்க்கும் மருத்துவ குணமும் உண்டு. எனவேதான் அணிகலன்கள் எல்லாம் பொன்னால் செய்யப்படுகின்றன. பொன், ஆடகம், கிளிச் சிறை, சாம்புநதம், சாதரூபம் என நால்வகைப்படும் என தமிழ் இலக்கியங்கள் கூறுகின்றன.

மனிதனின் வாழ்க்கை விதிகளின்படி நிர்வகிப்பது நவகிரகங்கள் என்ற அடிப்படையில், கிரகங்களின் பிரதிநிதியான நவரத்தினங்களும் அணிகலன்களின் பதிக்கப்படுகின்றன.

பொற்பணியாளர்களின் சிறப்பு

மனிதன், மனிதனாக வாழ்வதற்குப் பஞ்சபூத அடிப்படையில் ஐந்து ஐந்தாகப் பல கட்டுப்பாட்டு நெறிமுறைகளை வகுத்து வழி நடத்தினர் நம் முன்னோர்கள். அந்த வகையில் வேதங்களை ஐந்தாகத் தொகுத்துக் கொடுத்தனர். அவ்வாறே

தொழில்களையும் கொல்லர் (இரும்பு வேலை) தச்சர் (மர வேலை) கன்னார் (பாத்திர வேலை) சிற்பி (கோயில் மற்றும் சிற்ப வேலை) தட்டார் (பொற் பணி) என ஐந்து தொழில்களையும் ஒன்று சேர்த்து கம்மாளர் தொழில் எனக் குறிப்பிட்டு அவைகளைச் செய்பவர்கள் "விஸ்வகர்மர்கள்" என அழைக்கப்பட்டனர். இவர்களை ஜான் பிரெளன் என்ற அறிஞன் "makers of the world" என்று அழைக்கிறான்.

இவ்வாறான ஐந்தொழில்களின் வரிசையில் கடைசியாக வரும் பொற்பணித் தொழிலும் ஏனையவற்றைப் போலவே. கலைநுட்பமும், மதிநுட்பமும், பொறுமையும், நுணுக்கமும் உள்ளவர்கள் மட்டும் செய்யும் தொழிலாகும். 'ஓம்' என்னும் பிரணவத்தை உயிர் மூச்சுக்காற்றைப் பயன்படுத்திச் செய்யும் தொழிலாகும். மரபுசார் விஞ்ஞானமும் தொழில்நுட்பமும் கொண்டதென்பதில் மறுப்பு இருக்க முடியாது.

இவர்களின் தொழில் நுட்பத்திறனை போற்றாத அயல் நாட்டு அறிஞர்களே இல்லையெனக் கூறலாம்.

இத்தொழிலாளர்களையும், இச்சிறப்பு வாய்ந்த தொழிலையும் தக்க முறையில் ஆதரவும், பாதுகாப்பும் அளித்தால் நாட்டின் மரசு சார் விஞ்ஞானமும் தொழில்நுட்பமும் காப்பாற்றப்படுவதோடு அன்னிய செலவாணியை ஈட்ட உதவும் எனக் கூறிக் கொள்கிறேன்.

குலால சமூகம் முன்னேறாததற்கு காரணம் என்ன?

மு. தியாகராசன்,

மாநில பொருளாளர்

குலாலர் மன்றம்

குலால சமூகம் முன்னேறாததற்குப் பல காரணங்கள் உண்டு. ஒட்டுமொத்தமாக குலால சமூகத்தினரிடையே மண்டிக் கிடக்கும் அறியாமையும் வறுமையுமே முக்கிய காரணங்களாகும்.

குலால மக்கள் ஆங்காங்கு நகர்க்கப்படுவதற்கும், இவர்களின் உரிமைகள் பறிக்கப்படுவதற்கும் காரணமாக விளங்குவது, மனித வாழ்க்கைக்கு அடிப்படையாக தேவைப்படும் கல்வியும், பொருளாதார மேம்பாடும், ஒற்றுமையும் இவர்களால் இன்மையே ஆகும். அதோடு மனித வாழ்க்கைத் தேவைப்படாத கடவுள் மதம் சாதி ஆகியவற்றின் பேரால் மக்களைப் பிறர், சாதியின் பேரால் இழித்தும் பழித்தும் பேசுவதால் இவர்கள் தம்மைத் தாமே மறைத்து வாழ்வது இவர்களின் இயல்பான குணமாக அமைந்திருந்தலைப் பரக்க நாம் காணலாம். மனிதனை சாதி அடிப்படையில் உயர்ந்தவனென்றும், தாழ்ந்தவனென்றும் மதிப்பிடும் அநாகரீகப் பழக்கம் இந்நாட்டின் மிகப் பெரிய சாபக்கேடாகும். இதற்குக் குலால மக்கள் விதி விலக்கல்ல. இவ்விழிநிலை போக்கப்பட வேண்டுமானால் நம் நாடு பல சோதனைகளை அனுபவித்தாக வேண்டியிருக்கின்றது.

குலால மக்களிடையே காணப்படும் அறியாமைப் பிணியை ஒழிக்க குலால மக்களில் நூற்றுக்கு நூறு பேர் கல்வியறிவு பெற்றவர்களாக ஆக்கப்பட வேண்டும். அவ்வாறு ஆக்கப்படுவதற்குத் தடையாக இருப்பது இவர்களுடைய குலத் தொழிலாகிய குறிப்பாக மண்பாண்டத் தொழிலேயாகும். மண்பாண்டம் செய்யும் குடும்பங்களில் உள்ள உறுப்பினர்கள் அனைவரும் இத்தொழிலை இணைந்து செய்ய வேண்டிய கட்டாயம் உடையவர்களாக உள்ளனர். பிற குடும்பங்களைப்போல ஒரு குடும்பத்தில் ஒருவர் உழைத்து சம்பாதித்தால் போதும் என்ற நிலை குலால குடும்பங்களுக்குக் கிடையாது. இவர்கள் வாழ்க்கை சற்று விசித்திரமானது. கூலிக்காக பிறரை அமர்த்தி இத்தொழிலை செய்து கொள்ளலாம் என்றால், இஃது குலால குடும்பங்களை நட்டத்தில் கொண்டுச் சென்று செலுத்தி விடுகின்றது. எனவே, குடும்பத்தில் உள்ள அனைவரும் இணைந்து செய்தால் தான் ஒரு வேளைக் கஞ்சியாகிலும், குடித்து ஓரளவு உயிர் வாழ இவர்களால் இயலும் என்ற நிலை இன்று நிலவுகிறது. எனவே, தன் குடும்பத்தில் உள்ள அனைவரும் உயிர் வாழவேண்டித் தங்களுக்கு அறிமுகமான சுயதொழிலை மேற்கொள்ள வேண்டிய நிர்ப்பந்தத்திற்கு ஆளாக்கப்படுகின்றனர். ஆதலால் இவர்களும் இவர்களுடைய சந்ததியினரும் கல்வி பயில முடியாத சூழ்நிலையில் வாழ்ந்து வருகின்றனர். இவர்கள் கல்வியின் பயனை அறியாதவர்கள். வாழ்க்கைத் தேவையான கல்வியறிவு இவர்கள் பெற வேண்டுமெனில், இப்போது இவர்கள் மேற்கொண்டு செய்துவரும் குலத்தொழிலை நவீனப்படுத்தி குறைந்த நேரத்தில் சிறந்த பாண்டங்களை மலிவாக செய்யும்

உத்தியைக் கையாள வேண்டும். குலால சமூகத்தினரிடையே மூடபழக்க வழக்கங்கள் முழுமையாக காணப்படுகின்றன. அதற்கு மூலகாரணம் இவர்களிடம் சிந்திக்கும் தன்மை இல்லாததே. இவர்களின் முன்னோர்கள் ஏதோ ஓர் ஆடம்பரமான காரியத்தைச் செய்து வந்தார்கள் என்று சொன்னால் அதுபற்றி சிறிதுகூட சிந்திக்காமல் அம்மூடப் பழக்க வழக்கத்தை இவர்களும் தொடர்ந்து செய்ய வேண்டுமா? தங்களுடைய சொந்த கைத்திறத்தால் கடவுளர்களைப் படைத்துக் காட்டும் இவர்கள் அக்கடவுளர்களுக்கு அடிமையாவது விந்தையிலும் விந்தையாகும். இவர்கள் சிறு தெய்வ வழிபாட்டிலும், தாங்கள் எண்ணியது எண்ணியாங்கு பெற அக்கடவுளர்களுக்கு அநாகரிகமாக உயிர்களை பலியிட்டு கொல்வதிலும், அவற்றின் ஊனைத் தின்று மகிழ்வதிலும் திளைக்கின்றனர். என்னே பேதமை! உதாரணத்திற்கு குலாலர்கள் நாட்டின் பல பகுதிகளில் சிறு தெய்வங்களுக்கு வழிபாடு செய்வதற்காக, ஆயிரக்கணக்கான குடும்பங்கள் ஒவ்வோர் சமயத்தில் ஒவ்வோரிடத்தில் ஒன்றுகூடி, ஆடுகளை இரத்தம் சொட்டச் சொட்டக் கொண்டு அவற்றின் விருந்து சமைத்து உண்ணும் வழக்கம் உள்ளது. இதற்காக குலாலர்கள் லட்சக்கணக்கான ரூபாய்களைச் செலவழித்து விழாக் கொண்டாடுகின்றனர். இவ்விழாக்களால் இதுவரை குலால சமூகத்தில் முன்னேற்றம் ஏதும் ஏற்பட்டதாக தெரியவில்லை. இது போலவே "தெய்வம்" செய்வது என்ற பேரில் முறை போட்டுக் கொண்டு கடவுளர்களின் சிலைகளை சுமந்து கொண்டு ஊர் ஊராகச் சுற்றி, அதற்காக பெரும் பொருளைச் செலவழித்து விட்டு பின்னர் வறிஞராக வாழ்வதையும் காணமுடிகின்றது. ஏழைக் குலாலன் ஒருவன் ஒருமுறை "தெய்வம்" செய்தால் போதும், அவன் பல தலைமுறைக்கு தலையெடுக்க வொட்டாது அவதியுறுவதை நாம் இன்னும் காண்கிறோம். சடங்குச் சம்பிரதாயங்களிலே மூழ்கி நேரத்தையும் பொருளையும் வீணே செலவழித்துக் கொண்டு சீரழிகின்றனர். இவர்களின் இந்த ஏற்பாட்டிற்கு ஒத்துழைக்காத எவரையும் சாதிக் கட்டுப்பாட்டின் கீழ் ஒதுக்கி விடுகின்றனர். இத்தகு தேவையற்ற சமூகக் கட்டுப்பாடுகள் ஒழிக்கப்பட வேண்டும். இவற்றிற்கெல்லாம் அடிப்படை அறியாமை தானே? சில படித்த இளைஞர்களும் இவ்வறியாமைக்கு வாழையடி வாழையாக ஆட்பட்டு விடுகின்றனர். அவ்வண்ணமே செல்வந்தர்கள் சிலரும் இப்பழக்க வழக்கங்களுக்கு அடிமையாவதை புரிந்து கொள்ள முடியவில்லை. இவர்களை எண்ணி உண்மையிலேயே பரிதாபப்பட வேண்டியதாயுள்ளது.

ஒரு சமூக முன்னேற்றத்திற்கு அச்சமூக மக்கள் கல்வியிலும் பொருளாதாரத்திலும் முன்னேறுவதோடு தெளிவுற்றவர்களாகவும் சுய சிந்தனை படைத்தவர்களாக விளங்குவது மிக மிக அவசியமாகும்.

“குலாலர் கலங்கள்”

S. பெரியசாமி,

No. 1, கடம்பர் கோவில்

குளித்தலை 639 104.

திருச்சி மாவட்டம்

கூல்தோன்றி மண்தோன்றிய போதே இறைவனின் படைப்புக் கடவுள் பிரம்ம தேவனின் மறுபாதி என அனைத்து மக்களாலும் போற்றப்படும் சமூகம் குலாலர் சமுதாயம். படைப்புத் திறனும் உலகின் ஒரு பொருள் வெளிப்பாடு, அதன் மூலம் இன்றைய அறிவியல் வளர்ச்சி வெளிப்பாட்டுக்குக் காரணம் இக்குலாலனே ஆவார்.

மறுதலைமுறை, முன்னைய தலைமுறையின் நாகரிகம், அறிவியல், தொழில், சடங்குகள், சம்பிரதாயங்கள் அழியாது புதை பொருளாக வெளிப்படுவன இவன் படைக்கும் மண் பாண்டப் பொருள்களே.

குலாலர் படைப்புப் பணி

மக்கள் மன்றத்தில் அவன் பெறும் சிறப்பு, பரிவட்டம், தெய்வச் செயல், வைத்தியம், நோய் நீக்கம், கோவில் பூசாரிகள் செய்யும் பாத்திரம், தண்ணீர் குழாய், கோவில் விக்கிரகங்கள், நினைவு சின்ன கோவில் காளைகள், ஆடுகள், பூனை, கோவில் முனியப்பன் சிலைகள், எதிர் நந்தி சிலைகள் போன்றவை இக்குலாலனின் படைப்பு சின்னம்.

கட்டிட தோன்றுவாய்

கட்டிட வெளிபாடாக கோபுர கலசங்கள், கூரை ஓடுகள், தரை ஓடுகள், செங்கல், மொசைக், ஹாலோ பிரிக்ஸ், கோபுர சிலைகள், வண்ண ஒவியச் சிலைகள் குலாலர் வெளிப்பாடுகள்.

வேளாண்மை வெளிப்பாடுகளாக அழகிய பூச்செடிகள் மர வளர்ப்பு செடிகள், கன்று வளர்ப்பு, சிறிய செடிகள், கோவில் விழா அக்கினி சட்டிகள், அகல் விளக்குகள், சேமிப்பு உண்டியல், தோல் பதப்படுத்தும் தாழிகள், சமையல், தண்ணீர் பாளை, ஜாடிகள், கூஜாக்கள், இக்குலாலனின் ஆதிகால படைப்புச் சின்னங்கள்.

முதல் முடிவு நினைவு சின்னங்கள்

திருமண விழா அரசாணி, களையம், முளைப்பாளிகள், அகல் விளக்குகள் முதலிய பொருட்களின் படைப்பாளனும், மனித இறுதிச் சடங்கு படைப்பாளியும் இக்குலாலர் இனத்தவனே ஆவான்.

இறைவனின் நோன்பு பங்கு பணிகள்

இறைவனின் படைப்புப் பொருளாகிய மூலவிக்கிரகம், எதிர்நிற்கும் நந்தி, பக்கவாட்டில் முனியப்பன், வெளியே எதிர்நிற்கும் அக்கினி சட்டிகள், விளக்குகள், மாவு பிசையும் புது பாத்திரம், பொங்கல் பாளைகள், துவக்கால், சும்பம், கரகம் போன்றவை குலாலன் படைப்புக்கள். கோவில் பூசாரி தனமும் உண்டு.

ஆட்சி முறையில் பங்கு பணி

சில மேலை நாடுகளில் ஆப்பு வடிவ எழுத்து முறை இருந்தது. இது மண் ஓட்டில் எழுதப்பட்டது. சங்க காலத்தில் குயக்கொண்டான் என்ற வடமொழிப் புலவர் ஒருவர் இக்குலத்தில் தோன்றி சிலை வடிவ வாகனங்களே உயிர் பெற்று படைநோக்கிய “சாலிவாகனன்” இக்குல தோன்றல். இன்றைய ஆட்சியாளர் மைசூர் அரசர் இக்குலத்து தோன்றியவர். சைவ பெரியவர்கள் 63 நாயன்மார்களின் 2-வது வருபவர் “திருநீலகண்டர்” நாயன்மார் ஓர் குலாலன்.

இன்றைய நிலை

இத்துணை சிறப்புமிக்க குலாலர் இனம் தொழில் நலிவு, மண் எடுப்பு, சூளை போடல், விற்பனையில் இடர்பாடு, மாற்று தொழில், தொழில் பாதுகாப்பு இல்லை. கொடுக்கும் சலுகை பெற முடியாத, இடர்பாடுகள், விகிதாசார சலுகைகள், அரசு பங்கு பணி, கணக்கு எடுப்பு, இலவச வீடு, மனை பட்டா, தொழில் கடன், தாழ்த்தப்பட்டவர்களுக்கு வழங்கும் அரசு இவ்வின மக்களுக்கு வழங்க சமூகம் மேம்பாடு அடைய ஆவண செய்ய வேண்டும்.

தமிழகக் குலாலர் சமுதாயமும், தொழிலும்

P.K. முத்துசாமி,

16 கவிபாரதி வீதி

சாஸ்திரி நகர்

ஈரோடு - 2

மண்பாண்டத் தொழில் புரிந்தோனே முதல் அறிவியலான்

மனித நாகரீகத்தின் முதல் நாகரீகமே மண்பாண்டத் தொழிலில்தான் ஆரம்பித்திருக்க வேண்டும். 'திருகை' என்ற சக்கரத்தைக் கண்டவன் மண்பாண்டத் தொழிலாளிதான். சக்கரத்தின் அதாவது வட்டத்தின் அடிப்படையில்தான் ஒவ்வொரு இயந்திரமும் உண்டாகிறது என்பது நினைவு கூறத்தக்கது.

சமுதாயத்தின் முதுகெலும்பாளன்

பிறந்த குழந்தைக்கு பாலூட்டும் அகல் விளக்கிலிருந்து, மனிதனின் அன்றாடத் தேவைகளான தண்ணீர்க் குடம், சமைக்கும் சட்டி, உண்ணும் கலம், நீர் தேக்கி வைக்கும் பெரிய பாளை, உணவுப் பொருள் சேமிக்கும் கலமான 'குருது', உரிப்பானைகள், அடுக்கு மொடாக்கள் கால்நடைகளுக்குத் தேவையான கலங்கள் அனைத்தும் குலாலனின் மட்பாண்டங்களே. சமுதாயத்தின் அனைத்து மக்களுக்கும் தேவைப்பட்டவனாக இருந்ததால், அனைத்து மக்களாலும் குலாலன் பாதுகாக்கப்பட்டான்.

சங்க காலத்தில் உயர்நிலை

இரண்டாயிரம் ஆண்டுகளுக்கு முற்பட்ட சங்ககாலத்தில் குயவர் இனம் உயர்ந்த நிலையில் இருந்ததாக அறிய முடிகிறது. புறநானூறு, நற்றிணை போன்ற சங்க இலக்கியத்தில் 'வேட்கோ', 'கோ' என்று குறிப்பிடப்பட்டுள்ளன. 'நன் மதி வேட்கோ' எனச் சிறப்பிக்கப்படுகிறார்கள். மன்னர் அவைப் புலவராக ஒரு பெண்பாற் புலவரும் இருந்துள்ளார். இவைகளால் குலாலனின் உயர்நிலை உணர முடிகிறது.

பிற்காலத்தில் தாழ்நிலை

சங்க காலத்தில் உயர்நிலை கண்ட சமுதாயம்; பிற்காலத்தில் தாழ்நிலையை அடைந்தது. குயவர், குயவன் என்றும் பேச்சு வழக்கில் 'கொசவன்' என்றும் அழைக்கப்பட்டான். குடும்பத்தில் காலநேரம் பார்க்காது அனைவரும் உழைக்க வேண்டிய நிலை. மண் உடலிலும் துணிகளிலும் படிவதால் சுத்தமற்ற நிலை, கல்வி கற்காத காரணம், ஆதிக்க சாதியினரின் அடக்குமுறை இவைகளால் குலாலனின் சமுதாய அந்தஸ்து தாழ்வுற்றது.

மண்பாண்டப் பொருளுக்கு, பண்ட மாற்று முறையில் தானியங்களைப் பெற்று அன்றாட வாழ்க்கையை நிறைவு செய்து கொண்டமையால், நிலையான பொருள் வேறெது

வும் சேர்க்கவில்லை. எப்பொழுதும் ஏழ்நிலைதான்.

மண்பாண்டத் தொழில் சிதைவு

அறிவியல் வளர்ச்சியால் உலோகப் பொருள்கள் வரத் தொடங்கின. இரும்பின் வருகையால் பாதிப்பு ஏற்பட வில்லை. செம்பு, பித்தலைச் சாமான்கள் மட்கலங்களின் இடத்தைச் சிறிது சிறிதாக அபகரித்தது. அலுமினியம், எவர் சில்வர் பாத்திரங்கள் மட்கலங்களின் உபயோகத்தை அறவே பிடித்து விட்டன. இன்று பிளாஸ்டிக் சாமான்களாலும், மண்பாண்டங்களின் உபயோகம் வீடுகளில் இல்லாமையாகி விட்டது.

மண் கை வினைப் பொருட்கள்

மண் பொம்மைகள், கூஜாக்கள், சுவாமி சிலைகள், பூஞ்செடிச் சட்டிகள் இவைகள்தான் மண்தொழிலின் பரிமாணத்தைப் பகர்ந்து கொண்டுள்ளன. இவைகளெல்லாம் கலைப் பொருட்கள். காலத்தால் இன்னும் அழியாதவை.

அரசின் ஆதரவு

சுதந்திரம் பெற்றவுடன் அரசு கிராமக் கைத்தொழிலை நவீனப்படுத்த, புத்துயிருட்ட பல திட்டங்கள் போட்டு நடைமுறைப்படுத்தின. ஆனால், சமுதாய மாற்றத்தால், அறிவியல் வளர்ச்சியால் அரசின் முயற்சிகள் பலனளிக்கவில்லை. நவீனப் பயிற்சிகள், கூட்டுறவு சங்கங்கள் எல்லா முயற்சியும் பலன் கொடுக்காமையால் மண் தொழில் குறிப்பாக வீட்டு உபயோகத்திற்குத் தேவையான மட்கலங்கள் அன்றாட உபயோகத்திலிருந்து மறைந்துவிட்டன. இதற்கான அரசின் ஆதரவும் விழலுக்கிரைத்த நீராயிற்று.

இனி வேண்டுவது என்ன?

பாரம்பரிய புராதனமான மண்பாண்டத் தொழிலில் இனி எஞ்சி நிற்பது கலைப்பொருளே. இவைகளாவது அழியாது காப்பாற்றப்பட வேண்டும். இதற்கு அரசின் ஆதரவும், இளைஞர்களின் முயற்சியும் தேவை. மக்கள் விரும்பி வாங்கும் வண்ணம் மக்களின் ரசனைக்கேற்ப மாற்றம் தேவை. தொடர்ச்சியான ஆராய்ச்சியும், உற்பத்தியாகும் பொருள்களுக்கு நல்ல சந்தையும் வேண்டும். இதை அரசும், அரசு சார்ந்த நிறுவனங்களும் செய்ய முடியும். இந்திய நாட்டுப் பல்கலைக் கழகங்கள் இதில் உதவ முடியும்.

பாரம்பரிய அறிவியல் தொழில் நுட்ப மாநாடு இதற்கான அடிப்படைத் தளம் அமைக்க வேண்டும்.

களிமண் சொற்பட்டியல்

K.K. பழனிச்சாமி,

178, சாஸ்திரி நகர்

ஈரோடு 638 002.

தயாரிப்பு முறை

சுத்தமான களிமண், ஏரி, குளம், குட்டைகளில் கிடைக்கும் அடி வண்டல் மண், இதனை வெயில் காலங்களில் ஜூன், ஜூலை மாதங்களில் ஆண்டுக்கு தேவைப்படுகின்ற மண்ணை சேகரித்து வைத்துக் கொள்வார்கள். கூட்டு குடும்பக் கைத்தொழில், ஒவ்வொரு ஊரிலும் குலாலர் குடும்பம் இருக்கும். ஓர் எல்லை உண்டு. அதற்குள் தான் மண்பாண்டம் விநியோகம் செய்ய வேண்டும். கட்டுப்பாட்டுடன் செயல்படுவார்கள். ஊரில் போதுமான திருவிழா திருமணம், சடங்கு போன்ற காரியங்களுக்கு ஆண்டுக்கு ஒருவர் சட்டிப்பானை மற்றும் அதற்கு வேண்டிய பாத்திரம் கொடுத்து அவர்கள் கொடுக்கும் அரிசி, நெல் போன்றவைகளைப் பெறுவார்கள்.

தொழில் செய்தல்

களிமண்ணில் தேவைப்படும் மணல் சேர்த்து தண்ணீரில் ஊர வைத்து பிறகு காலால் மிதித்து கையால் பிசைந்து வெண்ணைபோல் உருட்டி, திரட்டி சக்கரத்தில் வைத்து பெண்கள் மூலம் கையில் திருவையை சுற்றியதும் ஆண் குலாலன் வனைவார். எந்த வடிவில் பாளை வேண்டுமோ அதற்கேற்ப மனைவார் அல்லது வனைவர். பிறகு அதை சிறிது உலர வைத்து மரத்துட்டு பலகையால் உருண்டை கல் உதவியுடன், தட்டி பெரிய அளவு, சிறிய அளவு சைஸ் தகுந்தவாறு தட்டி ஒரே சீராக அமைப்பார்கள். களிமண்ணால் கைவினைப் பொருள்களையும் தயாரிப்பார்கள். 50 மில்லியிலிருந்து 500 லிட்டர் தண்ணீர் பிடிக்கும் பெரிய பாளைகள், மண் குவளை, தட்டு, அகல் விளக்கு, குத்து விளக்கு, மண் கலசம், குடம்,

செம்பு, கடாய் சட்டி, சமையல் பாத்திரம், விக்கிரகம் போன்றவைகளை உருவாக்கி, நன்றாக வெயிலில் உலர்த்தி காவி வர்ணம் பூசி, குலை போட்டு பிறகு எரிபொருள்களை சீராக அடுக்கு அதற் மேல் மண்பாண்டங்கள் மற்றும் உள்ள மண் கைவினைப் பொருள்களையும் அடுக்கி அதற்குமேல் பனை ஓலை அல்லது கரும்புத் தோகையை மேலே பரப்பி அதற்கு மேல் பசும் இலை தழைகளை போட்டு பச்சை மண்பாத்திரம் தெரியாத அளவுக்கு மூட்டி தீயிட்டு கொளுத்தி சுமார் 10 மணி நேரத்தில் மண் பாண்டம் நன்றாக கட்டு விடுவார்கள். பிறகு ஆற வைத்து வரிசைக்கிரமமாக அடுக்கி வாடிக்கையாளர்களுக்கு ஆண்டுக்கு இருமுறை கொடுத்து வருடத்திற்கு ஒரு முறை நெல் அல்லது தானியம் கொடுப்பார்கள்.

களிமண் காயகல்பம்

ஆடு, மாடு, நாய், கோழி, வீட்டுக் கால்நடை பிராணிகளுக்கு கால் முறிந்துவிட்டால் அதற்கு வடித்து எடுத்துத களி மண் குழம்பை வெள்ளைத் துணியால் இருபுறமும் தடி மூங்கில் கம்பு சிம்பு வைத்து கட்டினால் கால் எலும்பு கூடி உள்ளது. இப்படி மூன்று கட்டு கட்டியபின் குணமாகிவிடும். இதுவும் குலாலர் மக்கள்தான் செய்வர்.

நாட்டு மருந்துகள் செய்ய மண்பாண்டம் தேவைப்பட்டன. கிராமங்களிலும் நகரங்களிலும் நடைபெறுகின்ற திருமணங்களுக்கு வர்ண வேலைப்பாடான பாளைகள், கரவம், சீர்பாளைகள் போன்ற இவைகளை மட்டும் தான் ஒரு சிலர் அக்காலம் தொட்டு இதுவரை வாங்கி குலாலர்களுக்கு உதவுகின்றனர். அதற்கேற்ப நெல் அல்லது தானியம் கொடுப்பார்கள்.

இயற்கை சாய முறைகள்

தமிழ்நாடு பத்மசாலியர் சங்கம்

செயற்கை ரசாயனப் பொருட்களை (Chemical Dyestuff) கொண்டு தற்போது சுத்தப் பட்டுக்கு சாயம் போடப்படுகிறது. ஆனால், ஐம்பது ஆண்டுகளுக்கு முன் இயற்கை முறையிலும் பட்டுக்கு சாயம் போடப்பட்டது. முன்பு மஞ்சளை (Turmeric) மைபோல் அறைத்து அதில் நீர் ஊற்றி அந்தக் கலவையில் பட்டினை ஊரவைத்து அதன்பின் பச்சை நிறப் பொடிகளைக்

கரைத்து மஞ்சள் நிறப் பட்டின்மேல் பச்சை சாயம் போட்டனர். மேலும் முற்றிலும் இயற்கை முறையில் சிவப்பு நிற சாயம் போடப்பட்டது. சீல் வைக்கும் **அரக்கு** இந்த சாயத்துடன் சம்பந்தப்பட்டதால் இந்த சிவப்பு நிறத்திற்கு அரக்கு என்ற பெயர் நிலைத்து விட்டது.

இயற்கை அரக்கு சாயம் போடும் முறை

மரங்களில் இருந்து எடுக்கப்படும் பழுப்பு நிறமுள்ள அரக்குக் கட்டிகளை கடைகளில் இருந்து வாங்கி வந்து அவற்றை சிறு சிறு துண்டுகளாக இடித்து பொடி செய்து இந்த சிறு துண்டுகளை பெரிய மண் கொப்பரைகளில் போட்டு கொதிக்கும் வெந்நீரை அதில் ஊற்றி மரத்தினால் ஆன மத்தை நான்கு பேர் கொப்பரைகளுக்கு சுற்றிலும் உட்கார்ந்து கடையும்போது அந்த அரக்கில் இருந்து சிவப்பு நிற திரவம் வெளிவரும். கொதிக்க வைத்த நீரை நான்கு ஐந்து முறை ஊற்றி கடையும்போது அரக்கு சாயம் முழுவதுமாக வெளிப்பட்டு எஞ்சியுள்ள அரக்கு நிறமிழந்த சிறு சிறு கண்ணாடிச் சில்லுகளாக மிஞ்சியிருக்கும். இந்த சில்லுகளை சீல் வைக்கும் அரக்காக உபயோகித்தனர். சாயநீரை எடுத்து வடிகட்டி அதில் சலவை செய்த பட்டினை நனைத்து எடுத்து பின்பு சாயத் தண்ணீரை கொதிக்க வைத்து அதில் சாயம் தோய்த்த பட்டினை ஒரு மணி நேரம் பெரட்டிக் கொண்டே இருப்பார்கள். நீரிலுள்ள சாயம் பெரும்பகுதி பட்டில் ஏறியவுடன் பட்டினை வெளியே எடுத்து குடு தணித்த பின் சுத்தமான தண்ணீரில் அலசி காய வைப்பார்கள். காய வைத்த பட்டு பளிச்சென்று அரக்கு நிற பட்டாக மாறிவிடும்.

இந்த இயற்கை சாய முறையை பல நூற்றாண்டுகளாக நாம் முன்னோர்கள் கையாண்டு வந்துள்ளனர். ஆனால், சென்ற ஐம்பது ஆண்டுகளாக செயற்கை முறையில் தயாராகும் ரசாயனப் பொருட்களால் (Chemical Dyes) சாயம் போடும் முறை பரவியதால் வேலை அதிகம் கொண்ட இயற்கை சாய முறைகள் குறைந்து வந்து இன்று முற்றிலும் மறைந்துவிட்டது.

இந்த இயற்கை அரக்கு சாய முறையை கண்கூடாகப் பார்த்தவர்கள் இப்போது வெகு சிலரே உள்ளனர். அவர்களை அணுகி இந்த இயற்கை சாய முறையைப் பற்றி கேட்ட போது அவர்கள் மிகவும் சுவைபட பதில் அளித்தார்கள்.

தமிழ் - 10

கோர நாடு சேலைகளை பற்றி

தமிழ்நாடு பத்மசாலியர் சங்கம்

கோரநாடு சேலைகள் 40, 50 ஆண்டுகளுக்கு முன்பு மிகவும் பிரசித்தி பெற்று இருந்தது. இந்த ரகம் பாதி பட்டும், பாதி நூலும் கலந்த ரகம். பெரும்பாலும் சிவப்பு நூலும், மஞ்சள் பட்டும் ஆன ரகம். 8,7,6 கெஜங்களில் தயார் ஆனது. தற்சமயம் ஆடுதுறை, கோரநாட்டில் (மாயூரம்) 3 தறிகள் தான் நெய்கின்றது. 40 ஆண்டுகளுக்கு முன்பு கோரநாடு, ஆடுதுறை, திருமங்கலங்குடி, குறிச்சிமலை, சுவாமிமலை, திருச்சி ஜில்லாவில் தா.பமுனில், உடையார்பாளையம் அதிகமாக தயார் செய்யப்பட்டது.

இந்த கோரநாடு சேலைகள் தங்க குண்டுமணி, ரெத்தின பள்ளி, முகி, ஜப்பான் விசிறி, எள்ளு வர்ணம், தாட்டு புத்திரி,

அன்று தேவர்களும் அசுரர்களும் சேர்ந்து பாற்கடலை மந்தார மலை கொண்டு கடைந்தபோது அதிலிருந்து முதலில் வெளிப்பட்டது ஆலகால விஷம். பின்பு காமதேனு மஹாலக்ஷ்மி கடைசியில் அமிர்தம்.

அதே மாதிரி நாங்கள் பெரிய மண் கொப்பரையில் மராமத்து கொண்டு அரக்கை கடைந்தபோது அதிலிருந்து வெளிப்பட்டது அருமையான அரக்கு. சாயத் தண்ணீர் அதைக் கொண்டு பட்டுக்கு சிவப்பு சாயமேற்றி பெருமை பெற்றோம். நாம் மராமத்து கொண்டு அரக்கை கடைந்த போது நம் நினைவுக்கு வந்த தேவர்கள் பாற்கடலை கடைந்த செயலை சொல்லாமல் இருக்க இயலவில்லை.

Environmental Friendly Dyes

தற்போது உற்பத்தியாகும் செயற்கை ரசாயனப் பவுடர்கள் அதை உற்பத்தி செய்யும் தொழிலாளர்களை பாதிப்பதோடு அதனால் சாயம்போட்ட ஆடைகளை உடுத்துபவர்களையும் பாதிக்கிறது என்பதை ஆராய்ந்து அறிந்த மேலை நாட்டினர் சில வகை ரசாயனப் பொருட்கள் சேர்ந்த சாயம் ஏற்றி தயார் செய்த ஆடைகளை இறக்குமதி செய்ய தடை விதித்துள்ளனர்.

கெடுதல் விளைவுகள் இல்லாத இயற்கை சாய முறைகளை அரசு சார்ந்த நிறுவனங்கள் இப்போது தயார் செய்து செய்முறைகளை விளக்கிக் காட்டி அதை பிரபலப்படுத்த முயற்சிகள் அண்மையில் மேற்கொள்ளப் பட்டுள்ளன. தாவரங்களிலிருந்து தயார் செய்யப்படும் இயற்கை சாயப் பொருட்கள் விற்பனைக்கும் வந்துள்ளன.

இயற்கை சாய முறைகள் பற்றி ஆராய்ச்சிகள் மேற்கொள்ளப்பட்டு நல்ல பிரகாசமுள்ள எளிய சாயப் பொருட்கள் மலிவு விலையில் விற்பனைக்கு வந்தால் அதைப் பட்டாடை தயாரிப்போர் ஆதரித்து உபயோகித்து இயற்கை சாய முறைக்கு ஊக்கம் அளிக்க முன்வரத் தயங்க மாட்டார்கள்.

கடிகார விசிறி என்ற பெயரில் ரகங்கள் தயார் செய்து நன்றாக விற்பனை. நெய்யும் போது லேசான கஞ்சி போட்டு நெய்வார்கள்.

இந்த ரகங்கள், மைசூர், தமிழ்நாட்டில் கும்பகோணம், மாயூரம், திண்டிவனம் முதலிய ஊர்களில் அதிகமாக விற்பனை. இந்த ரக சேலைகளை பெண்கள் கட்டினால் மகாலக்ஷ்மி போல இருப்பார்கள். கோரநாடு சேலைகள் நூலும், பட்டினால் ஆன சேலையினால் பெண்கள் கட்டினால் உடம்புக்கு நல்லது. நம் சீதோஷணத்திற்கு ஏற்றது.

காலப்போக்கில் மேற்படி ரகம் விற்பனை குறைந்தது. வேறு பல ரகங்கள் வந்ததினால் விற்பனை குறைந்தது. பட்டு

ரகம் வந்தது. விற்பனை குறைந்ததினால் தயாரிப்பவர்கள் சிரமப்பட்டார்கள். சுத்தப்பட்டு ரகங்களை தயாரித்தார்கள். பட்டு ரகங்களுக்கு கூலி அதிகமாகவும் இருந்தது. நெய்கின்ற வர்களும் பட்டு தறியே கேட்கின்றார்கள். அதனால் நாளடைவில் கோரநாடு ரகங்கள் தயாரிப்பு குறைந்தது. மில்களும் போட்டி போட்டு பல ரகங்கள் தயாரிக்கின்றன.

இந்த கோர நாடு சேலைகள் தற்சமயம் 6 கெஜத்தில் பல்வேறு கலரில் தயார் செய்தால் நன்றாக விற்கும். கூலி அதிகமாக கொடுத்து தயார் செய்ய வேண்டும். அரசாங்கத்தில் ரிபேட் கொடுக்க வேண்டும். இந்த ரகங்களை பெரும்பாலும் பத்மசாலியர், கண்ணடியர், தேவாங்க செட்டியார்கள் நெய்கிறார்கள்.

தமிழ் - 11

தொழில் வளர்ச்சிக் கருத்துக்கள்

தமிழ்நாடு பத்மசாலியர் சங்கம்

தமிழ்நாட்டில் மட்டுமில்லாது இந்தியா முழுவதும் விவசாயத்திற்கு அடுத்தபடியாக கைத்தறி நெசவுத் தொழில் என்ற அடிப்படையில் இத்தொழிலை மத்திய, மாநில அரசுகள் பேணிக் காத்து வருகின்றன.

இத்தொழிலை மத்திய, மாநில அரசுகள் பேணி பாது காத்து வந்தாலும் இதன் வளர்ச்சியில் இதுநாள் வரை நல்ல முன்னேற்றம் அடையவில்லை என்பதை நாம் அறிவோம். இந்த நாடும் அறியும்.

இதுகுறித்து பல முறை மத்திய, மாநில அரசுகள் பல முடிவுகள் எடுத்தும், அதை நடைமுறைப்படுத்துவதில் பல சிக்கல்கள் உள்ளன. மேலும் அவற்றை நடைமுறைப்படுத்தவும் தவறி வருகிறது. மத்திய, மாநில அரசுகள், கைத்தறி நெசவுத் தொழிலுக்கென 22 ரகங்களை மத்திய அரசு ஒதுக்கீடு செய்து, இத்தொழில் வளம் பெற வேண்டுமென்று பல ஏற்பாடுகள் செய்தும் இதனை முழுமையாக நடைமுறைப்படுத்த முடியவில்லை.

ஆகவே இத்தொழில் வளர்ச்சி பெற தேவையான நடவடிக்கைகளை மத்திய, மாநில அரசுகள் கையாளப்பட வேண்டும் என்பது நமது எண்ணம்.

இத்தொழிலுக்கு நிலையான ஊதியம் வழங்கப்பட வேண்டும். நூல் விலையேற்றத்தின் போது துணி விலை குறையும். துணி விலையேற்றத்தின் போது நூல் விலை குறையும். இந்நிலை போக்கப்பட வேண்டும். நூல் விற்பனைக்கு வரும்போது எந்த விலை இருந்ததோ, அதேபோல் நெய்யப்பட்ட துணியின் விலை வெளிமார்க்கெட்டிற்கு வந்தபோது என்ன விலை இருந்ததோ அதே விலை இருக்க வேண்டும்.

இத்தொழில் புரியும் அனைவருக்கும் அரசு ஊதியம் போல் வழங்கப்பட வேண்டும். இந்தியா முழுவதும் ஒரே சீரான ஊதியம் வழங்கப்பட வேண்டும். இந்த ஊதியம் நிரந்தரமானதாக இருக்கவும் வேண்டும்.

கைத்தறி நெசவாளர்கள் கூட்டுறவு சங்கங்கள் வழங்கும் அனைத்து சலுகைகளையும் தனியார் மூலம் நெசவு தொழிலில் ஈடுபட்டிருக்கும் தொழிலாளர்கள் அனைவருக்கும் வழங்கப்பட வேண்டும்.

கைத்தறி நெசவுத் தொழிலில் ஈடுபட்டுள்ளவர்களுக்கு இலவச வீட்டு மனைப் பட்டாக்கள் உடன் வழங்கப்பட வேண்டும். அவர்கள் செய்யும் தொழிற்கூடமும், வசிக்கும் இருப்பிடமும் ஒன்றே என்பதால் அவர்களுக்கு சுகாதார முறையில் நவீன இருப்பிடமும், தொழிற்கூடமும் தனித்தனியாக ஒரே இடத்தில் அமைத்துத் தரப்பட வேண்டும்.

இத்தொழிலுக்கான கச்சாப் பொருட்கள் மத்திய, மாநில அரசுகள் மானியத் தொகையின் அடிப்படையில் வழங்கப்பட வேண்டும்.

கைத்தறி நெசவு சம்மந்தமான துறைகளை கொண்ட கல்லூரிகள் மற்றும் தொழில்நுட்ப கல்லூரிகள் இத்தொழில் செய்யும் குடும்பத்தை சேர்ந்தவர்களுக்கு சிறப்பு சலுகைகள் அளித்து அவர்களுக்கு கல்லூரிகளில் சேர இட வசதி செய்துக் கொடுக்கப்பட வேண்டும்.

மேலும் இவர்களுக்கு பள்ளியில் படிப்புடன் சேர்த்து தொழிலையும் போதிக்கலாம். அதன் மூலம் அவர்கள் தாம் படிக்கும் தொழிலில் சிறந்த நிபுணர்களாக திகழவும் வாய்ப்புண்டு.

இத்தொழிலில் குடும்பத்தில் உள்ள 6 வயது குழந்தைகள் முதல் முதியோர் வரை ஒன்றாக இருந்து தொழில் செய்தால்தான் இத்தொழிலை செய்ய முடியும். ஆதலால் இக்குடும்பத்தை சேர்ந்த குழந்தைகள் படிக்க வழிவகை இல்லாமல் போகிறது. இந்த நிலைமையை மாற்றி அமைத்து இக்குடும்பத்தில் உள்ள அனைத்துக் குழந்தைகளும் கல்வி கற்க ஏற்பாடுகள் செய்யப்பட வேண்டும்.

இத்தொழிலில் ஈடுபடும் நெசவாளர்களுக்கு ஓய்வூதியம், ஆயுள் காப்பீடு போன்ற திட்டங்களை அமுல்படுத்தப்பட வேண்டும். பெரும்பகுதி நெசவாளர்கள் காச நோயால் பாதிக்கப்படுவதால், இவர்களுக்கு மருத்துவ வசதியும், அவ்வாறு அவர்கள் மருத்துவ வசதி பெரும்போது நஷ்ட ஈடாக ஊதியமும் வழங்கப்பட வேண்டும்.

இவர்களுக்கு தேவையான திட்டங்களையும், கொள் கைகளையும் மத்திய, மாநில அரசுகள் உருவாக்கி அவற்றை நடைமுறைப்படுத்தி, இத்தொழில் செய்யும் தொழிலாளர்க

ளுக்கு தேவையான உதவியை செய்ய வேண்டும்.

மேலும் தொழில் குறித்து தொழில் நுட்பத் துறை, நிதி மற்றும் வர்த்தக அமைப்பு, நிர்வாக முறை, அரசாங்கக் கொள்கைகள், அரசியல் ஆதரவு போன்ற பல்வேறு நிலைகளில் இவர்களின் வளர்ச்சிக்கு தேவையானவற்றை மத்திய, மாநில அரசுகள் அளிக்க முன் வரவேண்டும்.

தமிழ் - 12

சித்த மருத்துவத்தில் காயகற்ப முறைகள்

T. அரவிந்த்,

சித்த மருத்துவக் கல்லூரி,
பாளையங்கோட்டை

சித்த மருத்துவம்

சித்தர்கள் பாரம்பரியமாக வழிவகுத்துத் தந்த அமுத கலையாம் இச்சித்த மருத்துவம், என்று தமிழ் உருவானதோ, அன்றே இம்மருத்துவமும் தோன்றியது. இம்மருத்துவத்தைத் தோற்றுவித்தவன் இறைவன் (சிவன்) என யுகி சிந்தாமணி கூறுகிறது. சித்த மருந்துகள் உடல்பிணியை அகற்றுவது மட்டுமில்லாமல் நம் உடம்பை சித்தி அடையச் செய்கிறது. இவ்வெண் பெரும் சித்திகளை அடைவதற்கு காயகற்ப முறைகளை பதினெண் சித்தர்களும் உருவாக்கி அருளினர். இம்மருத்துவ மறை விஞ்ஞானத்தைக் கடந்து மெஞ்ஞானத் தன்மையுடையது. நோயாளியின் வாதம், பித்தம், கபம் என்னும் திரிதோட நிலைகளின் நாடி நான்கறிந்து அதற்கேற்றாற் போல் மூலிகை, பாடாணங்கள் அல்லது சீலப் பொருள்களைப் பற்பமாகவோ, செந்தூரமாகவோ கொடுப்பதே சித்த மருத்துவமாகும். இது வாதம், லயித்தியம், யோகம் என்னும் பிரிவுகளை உடையது.

காயகற்பம்

காயம் என்பது உடம்பு; கற்பம் என்பது உடலைக் கல் போன்று பல நூற்றாண்டுகள் வாழச் செய்வதாம். உடம்பினை நோயுறாதபடி நன்னிலையில் வைத்திருந்து நரை, திரை மூப்பு, பிணி அகற்றி நன்மையைக் காப்பதே காயகற்பம். இக்கற்பமுறை சித்த மருத்துவத்தில் வைத்தியம், யோகம் எனும் பிரிவில் அடங்கும். காயகற்ப முறைகள் எண்பெருஞ் சித்தி அடைய உதவும் ஏணி போன்றது. இக்காலத்தில் ஆரோக்கியத்தோடு, பல்லாண்டு வாழவும் மரணத்தைத் தள்ளி வைக்கவும் இக்காயகற்ப முறைகளைப் பின்பற்றலாம்.

காயகற்பத்தின் வகைகள்

காயகற்பங்கள் பிறப்பால், கற்ப மருந்துகள், கற்ப பயிற்சிகள் என இருவகைப்படும். ஆட்சி முறைகளால் 'பொதுக் கற்பம்', 'சிறப்பு கற்பம்' என இரண்டு வகைப்படும். பொதுக் கற்பம் என்பது உடம்பை நோயின்றி மூப்பின்றி காப்பதாம்.

மேலும் இம்மாநாட்டில் எடுக்கப்படும் தீர்மானங்கள், வகுக்கப்படும் திட்டங்கள் ஆகியவற்றை சம்மந்தப்பட்டவர்களுக்கும், சம்மந்தப்பட்டத் துறைகளுக்கும் எடுத்துரைத்து அவற்றை நடைமுறைப்படுத்தப்பட வேண்டும் என்று வற்புறுத்தப்பட வேண்டும் என்பது எங்களது மனப்பூர்வமான எண்ணங்கள்.

சிறப்பு கற்பம் என்பது ஒரு குறிப்பிட்ட நோயை அகற்றி உடலை நன்னிலைக்குக் கொண்டு வருவதாம். இவ்விரண்டும் பன்னெடுங்காலம் வாழ வழி வகுக்கும்.

காயகற்ப மருந்துகள்

இக்கற்ப மருந்துகள் மூலிகை, தாது, சீல வகுப்புகளால் ஆனவை. மூலிகை, தாது போன்றவற்றால் ஆசிய கற்ப மருந்துகளைக் 'கற்ப அவிழ்தம்' என்பர். இவற்றை தனியாகவோ அல்லது சேர்த்தோ உண்ணுங்கால் முறைப்படி பத்தியம் இருந்து, நாள் கணக்கிட்டு, கூட்டியோ குறைத்தோ உண்டு வரவேண்டும். இக்காயகற்பங்களைப் பற்றிய விரிவான விளக்கம் கட்டுரையில் அளிக்கப்படும்.

மூலிகைக் கற்பங்கள்

மூலிகைகளை அன்றாடம் பறித்து உண்பது அல்லது முன்னரே செய்து வைத்ததை உட்கொள்வதே மூலிகைக் கற்பங்களாகும். நம் சித்தர்கள் பலவகையான மூலிகைக் கற்பங்களைக் கடைப்பிடித்து சித்தி அடைந்துள்ளார்கள். கற்ப மூலிகைகள் 108 எனக் கருவூரார் கூறியிருக்கின்றார். அவற்றுள் சில,

1. கடுக்காய் - Terminalia Chebula
2. குமரி - Aloe vera
3. அமுக்கரா - Withania somnifera
4. சரிசாலை - Wedelia calendulaceap
5. தூதுவேளை - Solanum trilobatum
6. கீழ்க்காய் நெல்லி - Pyllanthus niruri
7. சீந்தில் - Tirnospora cordifolia

இவையனைத்தையும் பின்னர் ஆராய்வோம்.

எல்லோருக்கும் காயகற்பமுறை

சித்தர்களால் மட்டுமே இவைகளைக் கடைப்பிடிக்க முடியும் என்பது தவறு. இல்லறத்தாரும் கற்ப முறைகளைப் பின்

பற்றி பல்லாண்டுகள் வாழலாம். பொது மக்கள், காயகற்பம் என்றால் ஏதோ உட்கொள்ளும் மருந்து என்று மட்டும் எண்ணி, கற்ப பயிற்சி முறைகளை அறியாமல் அதைச் செய்யாமல் பேரின்பத்தை அனுபவிக்காது இருக்கின்றனர்.

“நரை மரண மூப்பறியா நல்லுடம் பினரே
நற்குலத்தார் என அறியீர்”

தமிழ் - 13

இருப்பத்தியொன்றாம் நூற்றாண்டில் இந்திய மருத்துவத் துறை!

P. பாலு,

TMSRC

சேலம்

தீராத நோய்களையும் குணப்படுத்தும் அனுபவம் நம்நாட்டு மருத்துவர்களிடம் உள்ளது என்பதை யாரும் மறுக்க முடியாத உண்மை. ஆனால், அதை நிரூபிப்பதில் தான் சிக்கல் உள்ளது. அதாவது, அம்மருந்து நோயாளியின் உடலில் எந்த அளவிற்கு, எவ்வாறு வேலை செய்கிறது? என்பதை நோயின் முறிவு அறியாமை சக்தியாக வேலை செய்கிறதா? அல்லது மனித உடலில் இயற்கையாக உள்ள நோயெதிர்ப்பு சக்தி செயல் குறைந்துள்ளதை தூண்டிவிட்டு அதன்மூலம் நோய் எதிர்க்கும் சக்தியாக வேலை செய்கிறதா? என்பதையெல்லாம் அறிய முற்றிலுமாக தெரிந்து கொள்ள, நம் நாட்டு மருத்துவர்களிடம் போதிய அறிவியல் அறிவோ, அதற்கேற்ற அறிவியல் சாதனங்களோ ஏதும் இல்லை. ஆனால், ஒன்று மட்டும் மறுக்க முடியாத உண்மை. இம்மருத்துவர்களிடம் மருத்துவம் பெற்றுவரும் நோயாளிகளை ஆராய்ந்துப் பார்த்ததில் அனைவரும் அதிகப்படியான பின் விளைவுகளில்லாமல் குணமாகியுள்ளனர். இம்மாதிரியான மருத்துவ அணுகுமுறைகளை அலோபதி மருத்துவர்களால் ஒதுக்கப்படும் நிலை நீடித்து வருகின்றன என்பதே வருந்தத்தக்க ஒன்று. இதற்கு உதாரணமாக அரசு மருத்துவமனைகளில் ஹோமியோபதி மற்றும் சித்தா ஆயுர்வேத மருத்துவ பிரிவுகளுக்கு ஒதுக்கப்பட்டுள்ள இடத்தை எடுத்து கொள்ளலாம். அவை சவகிடங்கிற்கு ஒதுக்கப்பட்டுள்ள அறைபோல் ஒதுக்குபுறமாக தள்ளி வைக்கப்பட்டுள்ளது. அலோபதி மருத்துவ வசதிக்கு கொடுக்கப்பட்டுள்ள முக்கியத்துவம் இதற்கு கொடுக்கப்படவில்லை. நல்ல திறமைசாலிகளுக்கு மேலும் பரம்பரை வைத்தியர்களும் அரசாங்கத்திலும் ஆதரவு இல்லை.

புழுவெட்டு உள்ள ஒரு நோயாளிக்கு மூலிகைகளை தேய்த்து குணமாக்கி இருக்கிறார் ஒரு நாட்டு வைத்தியர். தெருவில் பழைய இருப்பு வாங்கும் ஒரு சாதாரண சில்லரை வியாபாரிக்கு மூன்று வருடமாக நெஞ்சு வலி தீரவில்லை. எனவே, துடிதுடித்துபோன அந்த நோயாளிக்கு ஒரு பறை வின் இரத்தத்தைக் கொடுத்து குணமாக்கியுள்ளார். இன்னொரு சாதாரண நாட்டு மருத்துவர். இதுபோன்றே ஏராளமான அனுபவ உண்மைகளை சொல்லிக் கொண்டே போகலாம்.

என்னும் இராமலிங்கர் வரிகள் போன்றி அனைவரும் காயகற்பம் பின்பற்றுவோம்; மரணம் தவிர்ப்போம். இந்த அடிப்படைக் கருத்துக்கள் விரிவாக ஆராயப்பட்டு கருத்தரங்கில் சமர்ப்பிக்கப்படும்.

இந்நோயாளிகளை எந்த விஞ்ஞான அடிப்படையில் குணமாக்குகின்றீர்கள் என்ற கேள்வி எழுப்பினால் அவர்களுக்கு அவர்களின் மருத்துவமுறையினை விளக்கும் விஞ்ஞான, செயல் மற்றும் போதனா அறிவு இல்லை. ஆனால், உண்மையில் அதிகப்படியான எந்த பக்க விளைவுகளிடமிடலாமல் அந்த நோயாளிகள் முழுமையான குணமடைந்துள்ளார்கள்.

இப்படிப்பட்ட எளிய, ஆனால், மிக அற்புதமான, எந்த ஒரு அதிகப்படியான பக்க விளைவுகளும் இல்லாத இயற்கையோடு இணைந்த இம்மருத்துவத்தை மற்றவர்களுடன் பகிர்ந்து கொள்ளாமைக்கும், பலபல காரணங்கள் உள்ளன. அவற்றில் சிலவற்றை மட்டும் கூறுகிறோம்.

1. தங்களை மருத்துவர்கள் என காட்டிக் கொண்டால் அரசின் மருத்துவத் துறை சட்டங்கள் தன்மீது பாயுமே என நம் நாட்டு மருத்துவர்கள் அஞ்சுகிறார்கள் என்பது யதார்த்த உண்மை.

2. மற்றவர்களுக்கு இம்மருத்துவ முறையை விளக்குவதால் தன்னுடைய தொழில் பாதிக்கும் (அல்லது) தன்னிடம் கற்றுக்கொண்ட சிஷ்யன் தன்னைவிட சிறந்தவராகி விட்டால் தனக்கு மதிப்பிழந்து போகுமே என்பதும், மற்றொரு காரணம்.

3. மேலும் தாம் ஒரு சாதாரண மருத்துவர் பல பெரிய மருத்துவ அதிகாரிகளிடம் இந்த அனுபவத்தை எப்படிச் சொல்வது? சொன்னால் கிண்டலாக நினைப்பார்களே, என்ற தாழ்வு மனப்பான்மையும் கூட.

4. அலோபதி மருத்துவர்கள், ஆங்கில மருத்துவம் இல்லாத வேறு மருத்துவர்களை கேவலப்படுத்துவார்களே என்ற தயக்கமும்,

5. சாதாரண நாட்டு மருத்துவர்களின் அனுபவங்களை அறிய அலோபதி மருத்துவர்கள் கௌரவம் பார்ப்பார்கள் என்ற அறியாமையும் கூட, இந்த நிலை மாற வேண்டுமானால் பாமர மக்கள் முதல் பட்டம் பெற்ற டாக்டர் வரை அனைவ

ரும் தங்களது அனுபவப்பூர்வமான மருத்துவங்களை முழுமையான அளவில் பகிர்ந்து கொள்ள வேண்டும்.

மேலும்

1. அரசு அனைத்து பொது மருத்துவ ஆராய்ச்சிக் கழகம் ஒன்றை மாவட்டம் வாரியாக நிறுவ வேண்டும்.

2. அதில் மருத்துவத்தில் ஆர்வம் உள்ள யாவரையும் அக்கழக உறுப்பினராக்க வேண்டும். உறுப்பினர்களுக்கு கல்வித் தகுதி, வயது, எதுவும் நிர்ணயிக்காமல் அனுபவம், திறமை ஆகியவற்றுக்கே முக்கியத்துவம் கொடுக்க வேண்டும்.

4. இவ்வாறு தனித்தனியாகவோ, அல்லது குழுவாகவோ மேற்கொண்ட மருத்துவ ஆராய்ச்சிகளை பொது மருத்துவக் கழகக் குழு ஒருங்கிணைக்க வேண்டும்.

5. படிப்பறிவில்லாத ஒருவரிடம் அல்லது கல்லூரி சென்று பட்டப்படிப்பு படிக்காத ஒருவரிடம் கேட்டறிய படித்து பட்டம் பெற்ற பெரிய மருத்துவ மருத்துவ பேராசிரியர்கள்,

மருத்துவ அறிஞர்களை கௌரவம் பார்க்காமல் உண்மை, அனுபவம், திறமை ஆகியவற்றிற்கு முதலிடம் அளித்து அவற்றை ஆராய முன்வரவேண்டும்.

6. நம் நாட்டில் ஏராளமான இயற்கை செல்வங்களாகிய மூலிகைகள் இருக்கின்றன. இதற்கெல்லாம் வெளிநாடு, அன்னிய செலாவணி என்றெல்லாம் தேவையில்லை. இந்த இயற்கை செல்வங்களில் உள்ள அபூர்வ மருத்துவ சக்திகளை ஆராய, ஆர்வத்தோடு யார் முன்வந்தாலும் பொது மருத்துவ ஆராய்ச்சிக் கழகம் அவர்களுக்குத் தேவையான எல்லா ஏற்பாடுகளையும் தாராளமாக செய்துக் கொடுக்க வேண்டும்.

7. வரலாற்றுப் பூர்வமான அனுபவ ரீதியான மருத்துவ உண்மைகளை பொது மருத்துவ ஆராய்ச்சிக் கழகத்தின் மூலம் ஆய்வுக்குட்படுத்திட வேண்டும். தீர்க்க முடியாத நோய்களையுடைய அனைத்து நோயாளிகளையும் இந்த பொது மருத்துவ ஆராய்ச்சிக் கழகத்தின் குழுவில் உள்ள மருத்துவர்களிடம் ஒப்படைத்து உரிய மருத்துவ முறையில் சிகிச்சைகளை அளித்திடல் வேண்டும்.

தமிழ் - 14

சித்த மருத்துவத்தில் நோயணுகாவிதி

S. இந்திரா,

சைதாப்பேட்டை, சென்னை-15.

முன்னுரை

கல்தோன்றி மன்தோன்றா காலத்து முன்தோன்றி மூத்த குடியாம் தமிழ்க் குடியைச் சார்ந்த சித்தர்கள் தங்கள் அறிவாலும், அனுபவ ஞானத்தாலும் எடுத்துரைத்த சித்த மருத்துவம் மிகச் சிறந்ததும் பழமையானதுமாகும். ஒவ்வொரு நாளும் ஒவ்வொரு புதிய மருத்துவ ஆராய்ச்சியைப் பற்றிய ஆய்வுகளும், கருத்துகளும் வெளிவந்து கொண்டிருக்கும் இவ்வேளையில் எத்தனையோ நூற்றாண்டுகளுக்கு முன்பே இன்று அனைவரும் ஏற்றுக் கொள்ளக்கூடிய வகையில் தொலை நோக்கு பார்வையுடன் பலவிதமான தத்துவங்களையும், நுட்பமான செயல்முறைகளையும் தன்னகத்தே கொண்டு விளங்கும் சித்த மருத்துவம் ஒரு சீரிய மருத்துவம் என்பதில் ஒரு சிறிதும் ஐயமில்லை.

பிணிவரும் காரணம்

உடலுடன் பிணைந்த உயிர் அனுபவிக்கும் இன்ப உணர்ச்சிக்கு மாறான உணர்ச்சியே பிணியாகும். அதாவது முக்குற்றங்களின் வேற்றுமையால் வருவது உடற்பிணி எனவும், முக்குணங்களின் மாறுபாட்டால் வருவது மனப்பிணி எனவும் இருவகைப்படும்.

உணவும், செயல்களும் ஒருவரின் உடல்நிலைக்கு ஒத்த

அளவிற்கு மிகுமாயினும், குறையுமாயினும் வளிமுதலாக எண்ணப்பட்ட மூன்றுவித நோய்களும் அவருக்கு துன்பம் செய்யும். கருவின் உற்பத்தியில் தொடங்கி பிறப்பு முதலாக வாழவேண்டிய நெறிமுறைகள், கடைபிடிக்க வேண்டிய ஒழுக்கங்கள் இவற்றிலிருந்து தவறும்போது ஏற்படும் நோய்கள் இவற்றின் வாயிலாக இறப்பு வரைக்கும் மிகவும் துல்லியமானதொரு கருத்துக்களை சித்தர்களால் தெளிவாகக் கூற முடிந்துள்ளது. பரிணாம வளர்ச்சியில் மனிதனின் ஆரம்ப கலாந்தொட்டே நோய்களும் அவனைச் சார்ந்தே வந்து கொண்டிருக்கிறது. இவ்வாறு நோய்வாய்ப்பட்டு வருந்தி அதைத் தீர்க்கும் வழிமுறைகளை தேடுவதைக் காட்டிலும் சித்த மருத்துவத்தின் சிறந்த நோக்கமாகிய பிணியணுகாவிதியைப் பேணுதலே சிறந்ததாகும்.

நோயணுகாமல் இருக்க கடைபிடிக்க வேண்டிய ஒழுக்கங்கள்

பசுவின் பாலை உண்போம். எண்ணெயிட்டு தலை முழுகும்போது வெந்நீர் குளிப்போம். பகற்பொழுதில் புணர்ச்சியும், துயிலும் கொள்ளக் கூடாது. வயதிற்கு மூத்த மாதரையும், இளவெயிலையும் விரும்பக் கூடாது. இடது கையை கீழ்வைத்து உறங்கவேண்டும். புளித்த தயிரை உண்ண வேண்டும். முதனாளில் சமைத்த உணவை அருந்தக் கூடாது. பசி வந்தாலொழிய உண்ணக் கூடாது.

நாளொன்றுக்கு இருமுறை மட்டுமே உணவு கொள்ள வேண்டும். இரவில் மட்டுமே தூங்க வேண்டும். பெண்களை திங்களுக்கு ஒருமுறையே சேரவேண்டும். தாகம் இருந்தாலும் உணவின் இறுதியிலேயே தண்ணீர் குடிக்க வேண்டும். கிழங்கு வகைகளில் கருணைக் கிழங்கையே புசிக்க வேண்டும். வாழைக்கச்சலை உண்ண வேண்டும். உண்ட பின்பு சிறிது தூரம் சிறுநடையும் கொள்ள வேண்டும்.

ஆறு திங்கட்கொருமுறை வாந்தி மருந்தையும், நான்கு திங்கட்கொருமுறை பேதி மருந்தையும் கொள்ளவேண்டும். ஒன்றரை மாதத்திற்கொருதரம் நசியமும், வாரத்திற்கு ஒரு முறை சவரமும் செய்ய வேண்டும். நான்கு நாட்களுக்கு ஒரு முறை எண்ணெய் தேய்த்து குளிக்க வேண்டும். மூன்று நாட்களுக்கு ஒருமுறை கண்களுக்கு மையிட வேண்டும். வாசனைப் பொருட்களையும், பூக்களையும் நடு இரவில் முகரக் கூடாது.

தமிழ் - 15

சித்த மருத்துவத்தில் இரசவாதம் - ஓர் ஆய்வு செல்வ சண்முகம்

தமிழர்கள் தங்களுக்கே உரிய கலைகளை சிறப்பாக உருவாக்குவதில் வல்லவர்கள். அங்ஙனம் தமிழர்களாகிய சித்தர்களால் சிறப்பாக உருவாக்கப்பட்ட அறிவியல் துறை தான் சித்த மருத்துவம். சித்தர்கள் என்பவர்கள் பரம்பொருளை உணர தம் வாழ்வை அர்ப்பணித்துக் கொண்டவர்கள். எவர் ஒருவர் இயற்கைக்கு அப்பாற்பட்ட செயல்களை உருவாக்குகிறார்களோ அல்லது அனுபவிக்கிறார்களோ அவர்களே சித்தர்கள் ஆவர். சிவன் முதல் சித்தர் என்று வரலாறு கூறுகின்றது. ஆரம்பத்தில் சித்த மருத்துவம் 'குரு சிஷ்யன்' என்ற முறைப்படி பரவி வந்துள்ளது. அதன் பின்பு ஒலைச் சுவடியில் எழுதப்பட்டுப் பாதுகாக்கப்பட்டு, ஒரு இடத்தில் இருந்து மற்றொரு இடத்திற்கு எடுத்துச் செல்லப்பட்டுப் பரவியுள்ளது. இவ்விதம் பரவித் தழைத்த சித்த மருத்துவம் ஆய்வு நோக்கில் அணுகுவோர்க்கு அட்சயப் பாத்திரம் போல் கருத்துக்களை வழங்குகிறது. சித்தர்கள் கூறாத செய்திகளே இல்லை என்றே கூறலாம். அவர்கள் மருத்துவர்களாக மட்டுமின்றி, சிறந்த புலவர்களாகவும், வானிலை வல்லுநர்களாகவும், சோதிட வல்லுநர்களாகவும், தத்துவ ஞானிகளாகவும், சமூக சீர்திருத்த வாதிகளாகவும் இருந்திருப்பதை அவர்கள் நூல்கள் வாயிலாக நாம் அறிய முடிகிறது. அவர்கள் கூறிச் சென்ற தத்துவங்களில் மிகவும் முக்கியம் வாய்ந்ததாகக் கருதப்படுபவைகள் மருத்துவம், யோகம், இரசவாதம் என்பவைகளாகும். சித்தர்களால் கூறப்பட்டவை நவீன அறிவியல் அடிப்படையில் ஆராயப்பட்டு தெளிவுபடுத்தப்படுமாயின், அவை உலகளவில் பரவும். அவ்விதம் இரசவாதத்தை ஆராய முற்படுவதே இக்கட்டுரையின் நோக்கம்.

இரசவாதம்

சித்த மருத்துவத்தில் முக்கிய அங்கம் வகிப்பதான இரச

இவ்வாறு கூறப்பட்டுள்ள எத்தனையோ நடைமுறை ஒழுக்கங்களை தவறாமல் கடைப்பிடித்து வந்தால் எமனுக்கு நம்மிடத்தில் எந்த வேலையும் இல்லை.

முடிவுரை

அன்று புற்றுநோய், நேற்று தொழுநோய், இன்று எய்ட்ஸ், நாளை என்னவென்று தெரியாமல் ஒவ்வொரு நாளும் ஒவ்வொரு நோயை நாம் சந்தித்துக் கொண்டிருப்பதற்கு சுற்றுப்புற சுகாதாரங்களும், அவன் விரும்பியோ விரும்பாமலோ ஏற்றுக் கொள்ள வேண்டிய சூழ்நிலை மாற்றங்களும் காரணமாக இருந்தாலும்கூட தனிமனித ஒழுக்கமே பெரும்பான்மையான பங்கு வகிப்பது மறுக்க முடியாத ஒன்று. அவற்றை தவறாமல் கடைப்பிடிப்பதால் நோய்களிலிருந்து நம்மை நாம் காத்துக் கொள்ள முடியும் என்பது தெளிவு.

வாதத்தை எளிய முறையில் கூறுவோமாயின், தாழ்ந்த நிலையில் உள்ள மட்டமான உலோகங்களை உயர்ந்த நிலையில் உள்ள உலோகங்களாக மாற்றுவது ஆகும்.

இரசவாதம் என்றால் என்ன? என நாம் அறிந்த உடனேயே, யார் இரசவாதத்தை உருவாக்கினார்கள்? ஏன் உருவாக்கினார்கள்? எப்போது முதலில் உருவாக்கப்பட்டது? எப்படி உருவாக்கினார்கள்? என்ற அடுக்கடுக்கான கேள்விகள் எழும்.

இரசவாதம் சுமார் 2000 ஆண்டுகளுக்கு முன்பு முதலில் உருவாக்கப்பட்டிருக்கலாம். இது சித்தர்களின் சித்திகளில் ஒன்றாகும்.

முதலில் இந்தியத் தத்துவ அடிப்படையில் இரசவாதத்தை அறிவோம். படைக்கப்பட்ட ஒவ்வொரு பொருட்களும் ஆன்மாவைப் பெற்றுள்ளன. ஆன்மா அது இருக்கும் பொருளை மேன்மைப்படுத்தி வளர்ச்சியடைச் செய்து அதே போன்ற பொருளையும் உருவாக்கும் என நம்பப்படுகிறது. ஆன்மா இரண்டு சிறிய பகுதிகளை உடையது. ஒன்று பிரம்மன், இது வளர்ச்சி ஆன்மா அல்லது ஆண் தன்மையுடையது. மற்றொன்று ஆன்மா எனப்படும். (மூலிகைக் கூட்டங்கள் அனைத்தும் பிரம்மன் வகையான ஆன்மா பெற்றவை). மற்றொன்று ஆத்மன் இது பெண் தன்மையுள்ள ஆன்மா ஆகும். (உலோக மற்றும் கனிமப் பொருட்களைத்தும் இவ்வகையான ஆன்மா அமையப்பெற்றவைகள்)

இவ்விரண்டு கூறுபாடுடைய பொருட்களின் சேர்க்கையானது புதிய சக்தியைத் தோற்றுவிக்கும். அச்சக்தி அழிவின் மையை ஏற்படுத்திப் பொருட்களை மேம்பாடு அடையச் செய்யும். உதாரணமாக குறிப்பிட்ட உலோகம் இலைச் சாறு

டன் சேர்ந்தால் அல்லது உருகி இணைந்தால், இரு துணை ஆன்மாக்களின் குணங்களை ஒருங்கே பெற்ற எளிதில் அழியாத உணர்ந்த உலோகம் கிடைக்கும்.

முந்தைய நூற்றாண்டுகளில் விஞ்ஞானிகள் இரசவாதம் நடப்பது சாத்தியமில்லை என உறுதியாக நம்பினர். இரசவாதத்தை எப்படி சித்தர்கள் தோற்றுவித்திருக்கலாம் என ஆராய்வோம். ஆரம்ப காலத்தில் சாதாரண உடல் துன்பங்களுக்கு எளிய தாவர மருத்துவத்தை பயன்படுத்தியிருக்கலாம். பின்பு, உடலை அழியாமல் காக்க, உடலை மேம்படுத்த மருந்துகளைக் கண்டுபிடித்திருக்கலாம். அது சிறப்பாக செயல்படுமா? என்று சோதிக்க, தாழ்ந்த நிலையில் உள்ள உலோகங்களை உருக்கி உருக்கு முகத்தில் மேற்படி சாவினை தடுக்கும் மருந்தில் சிறிது போட்டு கலந்து உயர்ந்த உலோகமாக மாறுகிறதா? என ஆராய்ந்ததன் மூலம் இரசவாதம் உண்டாகியிருக்கலாம்.

கருத்துரை

சித்தர்கள் இரச வாதத்தை மருத்துவத்திற்காக மட்டும் பயன்படுத்தியுள்ளார்கள். மேலும், இரசவாதம் மூலம்

பெறப்பட்ட உலோகத்தில் இரண்டு உலோகங்களின் தன்மை அடங்கி

யிருக்கும். அதாவது இரும்பை செம்பாக மாற்றிக் கிடைக்கும் அயச்செம்பில் இரும்பின் குணமும், செம்பின் குணமும் சேர்ந்து அமைந்திருக்கும். நாம் சில வியாதிகளுக்கு இரண்டு விதமான உலோகங்களை பயன்படுத்த வேண்டிய சூழ்நிலையில் மேற்படி இரசவாத முறைப்படி பெறப்பட்ட ஒரே உலோகத்தை பயன்படுத்தி இரு உலோக மருத்துவ குணங்களையும் பெற முடியும். இவ்விதம் இரசவாத முறைப்படி பெறப்பட்ட உலோகங்களைப் பயன்படுத்த உடல் வன்மை ஏற்பட்டு அது எளிதில் அழியாமல் பாதுகாக்கப்படும் என சித்தர்கள் கூறியுள்ளனர். மேற்கூறிய காரணங்களால் இரசவாதத்தைப் பயன்படுத்த பொருளாதாரச் சிக்கனம் உண்டாகி எளிய முறையில் தீராத வியாதிகளைத் தீர்க்க முடியும்.

இக்கருத்துகளின் அடிப்படையில் இரசவாதம் பற்றி கருத்தரங்கில் விரிவான உரை சமர்ப்பிக்கப்படும்.

தமிழ் - 16

பண்டைத் தமிழகத்தில் மருத்துவக் கல்வி

மரு.சே.பிரேமா, எம்.டி. (சித்தா),
இணைப்பேராசிரியர் மற்றும் தலைவர்,
தமிழ்ப் பல்கலைக் கழகம்,
தஞ்சாவூர்

பண்டைத் தமிழகத்தில் கல்வியானது மிகவும் சிறப்பாக இருந்தது. சங்க இலக்கியத்தில் பல்வேறு புலவர்களின் பெயர்கள். பலர் ஆசிரியத் தொழிலில் ஈடுபட்டிருந்தமையை உணர்த்தும். சங்க இலக்கியத்தில் மருத்துவன் தாமோதரனார், மருத்துவன் நல்லச்சதனார், சல்லியங்குமரனார் போன்ற பெயர்களும் உள்ளன. மருத்துவமும் மருத்துவக் கல்வியும், பழங்காலந்தொட்டே தமிழகத்தில் காணப்பட்டது என அறியலாம்.

பொதுக்கல்வி, சமயக்கல்வி, சிறப்புக்கல்வி என்பன

கற்றுத் தரப்பட்டது. சிறப்புக் கல்வி என்பது மருத்துவம், படைக் கலப் பயிற்சி, பொறி இயல் போன்ற தொழில் கல்வி எனப் பாகுபடுத்தப்பட்டிருந்தது.

சித்த மருத்துவம் மடங்களில் கற்றுத்தரப்பட்டது. இதற்கான சிறந்த சான்றுகள் சித்தர் இலக்கியங்களிலேயே உள்ளன. மருத்துவக் கல்வி பண்டைத் தமிழகத்தில் எவ்வாறிருந்தது என்பதை இன்றைய உலகுக்கு எடுத்துரைப்பதே இக்கட்டுரையின் நோக்கமாகும்.

மனித உணவின் விளக்கம் “ஆரோக்கிய பாதுகாப்பும் சத்துள்ள உணவும்”

N.K. ஸ்ரீராமலு,

மதுராந்தகம்

முன்னுரை

நம் பாரத தேச மக்களுக்குச் சராசரி வயது ஐம்பது ஆண்டுகளுக்கு முன் இருந்ததைவிட ஆங்கில மருத்துவத் தால் தற்போது இரு மடங்கு கூடியுள்ளது என்பது பாராட்டுக் குரியதாயினும், அப்போதிருந்த மனிதனின் ஆரோக்கியம், செயல்திறன் முதலியவை தற்போதைய மனிதனுக்கு வெகு வாகக் குறைந்துவிட்டது என்பதை மறுக்க முடியாது. இரு தலைமுறைகளாகவே பிணிகள் பெருகி நலிவுற்றுவிட்டார்கள் என்பது உண்மையாகும்.

மனிதனுக்கு பொருந்திய உணவு எது?

உலகிலுள்ள பலகோடி உயிரினங்களுக்கும் உணவை முன்னிட்டே அவைகளின் உடல் உறுப்புகள் அமைந்துள்ளன என ஆராய்ச்சியாளரால் கூறப்படுகிறது. அதாவது உணவைப் பெறுவதற்கும், புசிப்பதற்கும், செரிப்பதற்குமான வகையில் அதன் வெளி உள் உறுப்புகளைக் கொண்ட உடல் அமைப்பு அமையப் பெற்றிருக்கிறது. இவ்வகையில் அமைந்த உயிரினங்களைத் தாவர உண்ணிகள், புலால் உண்ணிகள், இரண்டும் கலந்த உண்ணிகள் என மூவகையாகப் பிரிக்கும்போது, மனிதனின் உணவு கனிகளும், கொட்டைகளும் தான் என்று கூறப்படுகிறது.

இயற்கை, அதனதன் உணவை முன் படைத்து, பின் தான் உயிரினங்களைப் படைத்துள்ளது. புல்லைப் படைத்து பின் பசுவையும், பாலைப் படைத்து பின் சேயையும் படைத்ததுபோல, உணவை முதலாக வைத்து உயிரினம் வாழ்கிறது. இயற்கையால் அந்தந்த உயிரினங்களுக்கு அன்று விதிக்கப்பட்ட பொருந்திய உணவிலிருந்து இன்றுவரை அவைகள் பிறழாமல் இருப்பதால்தான் அடுத்த வேலை உணவு நிச்சயிக் கப்படா நிலையிலும் எச்சிக்கலுமின்றி இன்பமாக வாழ்கின்றன. ஆரோக்கியப் பாதுகாப்பு, சத்துணவு என்ற கவலையு மில்லை. இயற்கை மனிதனுக்கு விதித்த பொருந்திய உணவு விதியில் இருந்து விலகியதால்தான் எல்லா சிக்கலும் வந்த டைந்துவிட்டது.

ஆரோக்கியத்தின் அடிப்படைகள்

உடலின் உயிரணுக்கள் உணவிலிருந்து தோன்று கின்றன என்பதை அறிந்திருக்கிறோம். உணவின் தரத்திற் கேற்பவே உயிரணுக்கள் அமையும் என்பதையும் அறிந்துள் ளோம். தரமுள்ள உணவு யாது என்பதைத்தான் அறியாமல்

இருக்கின்றோம். உயிர்ச் சக்தி நிரம்பிய இயற்கை உணவை உண்ணும்போது உடலிலுள்ள உயிரணுக்களின் ஆற்றல் பெருகுகின்றது. உயிரணுக்களின் ஆற்றல் பெருக்கத்தால் ஆரோக்கியம் தானே இயல்பாக வந்தடைகிறது. உடலின் சுற்றளவும் பெருக்கமும் ஆரோக்கியத்தை நிர்ணயிப்ப தில்லை. பொருந்திய - சரியான அளவான உணவே உடல் ஆரோக்கியத்தையும் வளர்ச்சியையும் நிர்ணயிக்கிறது.

மேலும், உணவைத் தேவைக்கதிகமாக - நாக்கிற்காக (சுவைக்காக) உண்ணுகிறோம். இதனால் உணவு நம்மை உண்டு வருகிறது என்பதை உணராமல் இருக்கிறோம். பெருந்தீனி உண்ணுதலால் அதை வெளித்தள்ளவே நம் உயி ராற்றல் முழுவதுமாக செலவழிக்கப்படுகிறது. இதனால் சூழ்ந் துள்ள பின் நச்சுக்களை எதிர்க்கும் ஆற்றலை உடல் இழந்து விடுகிறது. உண்மையில் தற்போது உண்ணும் உணவின் அள வில் பாதியளவு இயற்கை உணவை உண்டாலே போதுமா னது. இவ்வுணவை நன்கு மென்று, ருசித்து, நிதானமாக உண் ணும்போது உணவின் அளவு தானே நிர்ணயிக்கப்பட்டுவி டும். உயிராற்றலும் சேமிக்கப்படும்.

மனித உடலும் விலங்கின அளவே என விஞ்ஞானம் கூறுகிறது. பறவைகள், விலங்குள் தன் உடல் வளர்ச்சி, ஆரோக்கியம் குறித்து கருதுவதே இல்லை. ஆனால், நல்ல ஆரோக்கியமாக வாழ்கிறது. பசித்தபோது அதற்குரிய - விதிக்கப்பட்ட உணவை மட்டும் உண்டு வருகிறது. இவ்வகை யில் மனிதனும் இயற்கை விதித்த - பொருந்திய உணவை உண்டு உடலைக் குறித்த கவனம் இல்லாதிருக்க வேண்டும். பறவைகள், விலங்குகள் உடலளவில் வாழ்கின்றன. இயற்கை மனிதனைப் பரிணாம வளர்ச்சியில் மன வளர்ச்சிக்காகப் படைத்துள்ளது.

உணவைப் பற்றின சரியான ஆய்வு தேவை

உணவைப் பற்றின விஞ்ஞான ஆய்வினை இயற்கை யின் இணக்கத்தோடு உணவைச் சிதைக்காமல் நடத்தினால் பெரும் பயன் விளையும் என்பதில் ஐயமில்லை. உதாரணத் திற்கு தேங்கனி (தேங்காய்) ஆய்வை எடுத்துக் கொள் வோம். அதில் கொலஸ்டிரால் உள்ளது எனக் கூறப்படுகிறது. பொதுவாக எப்பண்டமும் தீயலிட்டுப் பொசுக்கினால் வேதி யியல் மாற்றமடைந்து கடினத் தன்மையாகித் தன் சுயதரத்தை இழந்துவிடும். தேங்கனி நீர் வற்றிடும்போது கொப்பரையாகி விடுகிறது. முளைக்கும் உயிராற்றலை இழந்து விடுகிறது. மேலும் அது உணவிற்கு பயன்படாது. அதை மேலும் தீயி லிட்டு சமைத்து ஆய்வு செய்யும்பொழுது அதன் தீமைகள்

வெளிப்படுகின்றன. கொப்பரையில் கொலஸ்டிரால் மட்டுமல்ல மேலும் பல தீமைகளும் புதைந்திருக்கும்.

தென்னை மரத்திலிருந்து உதிரும் நிலையிலுள்ள தேங்காய் தான் தேங்கனி ஆகும். அதில் தாதுக்கள் நிரம்பிய தூய நீர் இருக்கும். உயிராற்றல் ததும்பி முளைக்கும் திறனிருக்கும். தேங்கனி உதிரும் நிலைக்குச் சில நாட்களுக்கு முன் அறுத்து எடுப்பது தேங்காய். இளநீர் என்பது பிஞ்சு நிலையாகும்.

தேங்கனியை இயற்கைத் தன்மையோடு புத்தம் புதிதாக ஆய்வு செய்து - அதாவது தேங்கனி நீர் - உடைத்த மேல் பகுதி, கீழ்ப்பகுதி, வெள்ளைப் பகுதிக்கு மேல் ஒட்டி இருக்கும் மெல்லிய தோல் பகுதி (ஒடு அல்ல) இவைகளைத் தனித்தனியே ஆய்வு செய்து பார்ப்போமேயானால் தேங்கனி ஒரு முழு உணவு என்பது மட்டுமல்ல, மற்ற வகையால்

உடலில் சேர்ந்துள்ள வேண்டா கழிவுகளை வெளியேற்றும் திறன் கொண்டது என்பதும் விளங்கும்.

முடிவுரை

உடலினும் மனத்தை மேலாகக் கருதி வாழ்க்கையை நல்ல மகிழ்ச்சியாக அமைத்திருந்த நம் முதறிஞர்கள் பாரம்பரியமாக நல் வழிகாட்டிகளாகத் திகழ்ந்து வந்துள்ளனர். நல்ல ஆரோக்கியம் என்பது உடலும் மனமும் சேர்ந்து பெறவேண்டியதாகும். இவ்விரண்டு ஆரோக்கியத்திற்கு மூலமாய் விளங்குவது நல் உணவேயாகும். அவ்வுணவு அவ்வப்பகுதியின் தட்ப - வெப்ப நிலைக்கு ஏற்ப விளையும் உயிருள்ள இயற்கை உணவே ஆகும். இந்நோக்கில் விஞ்ஞான வளர்ச்சி ஏற்படின் பெரும் பயன் விளையும் என்பது திண்ணம்.

தமிழ் - 18

உடல் நலத்திற்கேற்ற உணவுகள்

குரு. ஆறுமுகம்,

சேலம் - 636 016.

“ஒருவரின் உணவு இன்னொருவருக்கு நஞ்சு” என்பது பழமொழி. காரணம் ஒருவருக்கு அரிசிதான் பிடிக்கும் என்றால் மற்றவருக்கு அது பிடிக்காது. பிடிக்காத ஒன்றை விருப்பமின்றி உண்கிறபோது உளவியல் மாற்றத்தால் ஒவ்வாமை ஏற்பட்டு உடல்தொல்லைகள் உண்டாகும். எனவே, இப்பழமொழி நாளும் பேசப்படுகிறது.

ஆயிரக்கணக்கான ஆண்டுகளாக உணவில் பல மாற்றங்கள் ஏற்பட்டுள்ளன. அவற்றைப் பார்ப்போம்.

ஆதிமனிதர்களின் உணவுகள்

காய் கனிகள், கொட்டைகள், இலைகள், கிழங்குகள், பின்பு வேட்டையாடிய விலங்குகளின் இறைச்சி.

ஆதி மனித சமூக அமைப்பில் பெண்ணே தலைவி. பங்கிட்டுமுறை சரியாக இருந்தது. காலப்போக்கில் பெரும் மாறுதல் ஏற்பட்டு பெண் சமைப்பவளாக, பிள்ளை பெறுபவளாக, வேலைக்காரியாக, ஏன் அடிமையாகக்கூட ஆக்கப்பட்டுவிட்ட அவலம். அது இன்றும் தொடர்கதை.

இன்று நம் நாட்டில் சமையல் செய்பவர்கள் பெரும்பாலும் பெண்களே! அவர்கள் ஆயிரக்கணக்கான சமையல் முறைகளை அறிந்துள்ளனர். ஆனால் பெரும்பாலானவை உடலுக்குத் தீங்கு விளைவிப்பவை. எரிபொருளை விரயமாக்குபவை. எனவே, நாம் நமது சமையல் கலையில் பாரம்பரிய முறைகளைக் கையாள வேண்டும்.

இன்று சோறு சமைப்பதற்கு ஒரே வகை தானியத்தை பயன்படுத்துகிறோம். அதுதான் பட்டை தீட்டிய வைரம் போன்ற அரிசி. இதில் மாவுச் சத்தைத் தவிர என்ன இருக்கிறது? கேரள மக்கள் தவிடு நீக்கப்படாத அரிசியைப் பயன்படுத்துகின்றனர். அதில் உள்ள நார்பொருள்கள் உடலுக்குக் கிடைக்கிறது. எனவே, அவர்கள் நலமுடன் இருக்கிறார்கள்.

நாமும் தவிடு நீக்கப்படாத அரிசியை விற்க, அரசை, வணிகர்களை கேட்டுக் கொள்ள வேண்டும்.

அரிசி, அது உற்பத்தியாகும் இடத்தின் உணவாக இருந்து, இன்று அதை முன்பு பயன்படுத்தாதோர் அனைவரின் உணவாகவும் மாறிவிட்டது. காலத்தின் கொடுமையா? அல்லது சொகுசுப் பண்பாடா? இன்று உணவுகள் சொகுசுக்காகவும், ஆடம்பரத்திற்காகவும் என ஆக்கப்பட்டுவிட்டது. எனவே, நாம் உடல் நலம்பெற அரிசியைத் தவிர்த்த மற்ற தானியங்களையும் பயன்படுத்த வேண்டும்.

முன்பு நாட்டுப்புறங்களில் கம்பு, கேழ்வரகு, தினை, சானம், வரகு, குதிரைவாலி, சோளம் என்ற சிறு தானியங்கள் பயிரிடப்பட்டு உணவாக்கப்பட்டன. அதேபோல் கொள்ளு, தட்டைப் பயறு, உளுந்து போன்ற பயறு வகைகளும் குழம்புக்குப் பயன்படுத்தப்பட்டன. இன்று நிலைமை என்ன? அவைகள் எல்லாம் மறக்கப்பட்டு அரிசியை மட்டும் பயன்படுத்தும் நிலை. புன்செய்த தானியங்கள் விளைந்த இடத்தில் இன்று பருத்தி மட்டும் அல்லது வேறு பணப்பயிர். இது பிற்காலத்தில் நம்மை கடும் உணவு நெருக்கடிக்கு இட்டுச் செல்லும். நெல்லுச்சோறு உண்பவர்கள் உயர்ந்தவர்கள், மற்றவர்கள் கீழ் என்ற பண்பாட்டுச் சீரழிவும் இதற்கு ஒரு காரணம். எனவே, இந்நிலையை மாற்ற நாம் கீழ்க்காணும் முறைகளையும் கையாள வேண்டும்.

கம்பு, கேழ்வரகு, தினை, குதிரைவாலி, சானம், வரகு, சோளத்தை சமைத்த உணவாகப் பயன்படுத்த வேண்டும். சமைக்காத உணவுகளாக கம்பு, கேழ்வரகு, சோளம், கோதுமை, கொண்டக்கடலை, நிலக்கடலை, பாசிப்பயறு, உளுந்து இவற்றை முளைக்கட்டி அதனுடன் தேங்காய்த் துருவல் வெள்ளம் சேர்த்து உண்ணலாம். இதுபோன்ற பல்வேறு இயற்கை உணவுகளைப் பற்றிய விவரம் இக்கட்டுரையில் விரிவாக விளக்கப்பட்டுள்ளது.

பத்மசாலியர்களின் எதிர்காலக் கனவு

தமிழ்நாடு பத்மசாலியர் சங்கம்

தமிழ்நாடு பத்மசாலியர் சங்கம் 1925-ஆம் ஆண்டு தமிழ்நாட்டில் சேலம் மாவட்டத்திலுள்ள அரிசிப்பாளையம் பகுதியில் முதன் முறையாக துவக்கப்பட்டது. அக்காலக் கட்டத்தில் சரியான வழிமுறைகள், வாய்ப்புக்கள் இல்லாமல் போனதினால் இச்சங்கம் தொடர்ந்து செயல்பட முடியாமல் போனது.

இதைத் தொடர்ந்து, நாளடைவில் ஆங்காங்கே சங்கங்கள் தோன்றின. இவை அனைத்தும் பலரின் சீரிய நோக்கத்தினாலும், அவர்கள் ஆற்றிய தொண்டினாலும் அமையப் பெற்றன. இருப்பினும் தொடர்ந்து செயல்பட முடியாமல் போனதினால் சங்கத்தின் செயல்பாட்டில் தொய்வு ஏற்பட்டது.

இருப்பினும் ஒரு சில சங்கங்கள் பண பலத்தினால் அப்பகுதி வாழ் இனமக்களின் சக்தியை கொண்டும், அவர்களின் உதவியினால் இன்றும் தொடர்ந்து செயல்பட்டு வருகிறது. ஆனால், மாநில அளவில் ஒரு நிலையான சங்கம் உருவாக் கப்படவில்லை.

22.2.1987 அன்று திரு. காஞ்சா ஆர். புருஷோத்தமன், ஆத்தூர் அவர்களின் சீரிய தலைமையின் கீழ் மாநிலச் சங்கம் உருவெடுத்தது. இச்சங்கம் ஒரு நிலையான நிதியை பெற்றிருந்ததா? என்றால் இல்லை. தற்சமயம் இனமக்களின் உதவியினாலும், இச்சங்கத்தின் மாநிலத் துணைத் தலைவர் திரு. கே.ஜி. இராமசாமி செட்டியார் அவர்களின் உதவியினாலும் நிலையான நிதிப் பெற்று இச்சங்கம் ஒரு வலுவான சங்கமாக வெற்றி நடைபோடுகிறது.

இந்தியாவில் விவசாயத்திற்கு அடுத்த தொழிலாக இந்த நெசவுத் தொழில் உள்ளதால், மேலும் இத்தொழிலையே பரம்பரைத் தொழிலாக கொண்டு, இத்தொழில் செய்து வாழ்ந்துவரும் பத்மசாலியர் சமுதாயம் முன்னேற்றம் அடைய வழிவகை இல்லாததால் இவர்களின் வாழ்க்கையில் வளத்தையும், முன்னேற்றத்தையும் காண முடியவில்லை. நெசவுத் தொழிலை உலகிற்கே அறிமுகப்படுத்தியது எங்கள் மூதாதையர்கள் என்பதற்கு புராணச் சான்றுகள் பல உள்ளன.

தமிழகத்தில் இவர்கள் கைத்தறி நெசவுத் தொழில் செய்யும் கஷ்டப்பட்ட ஜீவிகளாக, அரசியலில் ஆதரவற்ற அநாதைகளாக, பொருளாதாரத்தால் புறக்கணிக்கப்பட்டவர்களாக, ஆதாயம் தேடும் அரசியல்வாதிகளுக்கு ஒட்டு அளிப்பதன் மூலம் அவர்களை அதிகாரப் பீடத்தில் ஏற்றி வைக்கும் ஏணிகளாக மட்டுமே இருக்கிறார்களே தவிர எதுவும் கேட்டுப் பெற முடியாத உரிமைக்குரல் கொடுக்க இயலாத ஊமைகளாகவும் வாழ்ந்து வருகிறார்கள்.

இந்த இருண்ட நிலைக்கு என்ன காரணம் என்று சிந்தித்தது உண்டா? சென்று மறைந்த காலத்தில் அனுபவித்த ஆறாத்

துயரங்களையும், கஷ்டங்களையும் சற்றே உங்கள் மனக்கண் முன் கொண்டு வந்து சிந்தியுங்கள்.

இன்று நமக்கு கல்வி என்பது கானல் நீர். கல்லூரிப் படிப்போ வேனிற் காலத்து வெய்யிலாக அருகே வராதே என்று சுட்டெரிக்கிறது. தட்டுத் தடுமாறி பட்டம் பெற்றுவிட்ட ஒரு சிலரோ பெட்டிப் பாம்பாக பதுங்கி கிடக்கிறார்கள். பணம் கொடுத்து பேரம் பேச இயலாத நிலையினால் கலைக் கல்லூரி, பொறியியல் கல்லூரி, மருத்துவக் கல்லூரி போன்றவைகளில் நாம் புக முடியவில்லை. இவை எல்லாம் நம் குலக்கொழுந்துகளுக்கு எட்டாக் கனியாகிவிட்டது. இதுவரை எங்கள் இனத்தில் ஐ.ஏ.எஸ்., ஐ.பி.எஸ்., உயர்நீதிமன்ற நீதிபதி, உச்சநீதிமன்ற நீதிபதி, அரசுத் துறை உயர் அதிகாரிகள் யாருமில்லை.

நாம் செய்துவரும் பரம்பரை தொழிலோ தரித்திரத்தின் பிறப்பிடமாக, பிராண வாயுக் கூடாரத்திற்குள் தள்ளப்பட்டு அணு அணுவாகச் செத்துக் கொண்டிருக்கிறது. ஆனால், மத்திய, மாநில அரசு கைத்தறித் துறையின்மீது காட்டும் பரிவின் காரணமாக சற்று உயிர் வாழ்ந்து கொண்டு இருக்கிறது. இந்நிலை நீடித்தால் இத்தொழில் அழிந்துவிடும் அபாயம் தென்படுகிறது.

கலைமகளின் கருணை நமக்கு கிடைக்கவில்லை. மறுபுறம் நெவாலைகள் (பவரலும்) கைத்தறி நெசவுத் தொழிலை நிலை குலைத்து விடுகிறது. இப்பின்னணியில் நமது வாழ்க்கைத் தரம், பொருளாதாரம் எப்படி இருக்கும் என்பதை பார்த்தால் நமது சமூகம் வறுமைப் படகில் கடன் என்கிறப் பெருங்கடலில் தன் வாழ்க்கைப் பயணத்தை தொடர்ந்து நடத்தி வருகிறது. நூல் விலை ஏற்றத்தால் பற்றாக்குறை என்னும் புயல் தாக்கும் போது நாம் நிலைத் தடுமாறிக் கடலில் மூழ்கிவிடும் அபாயம் உள்ளது.

இந்நிலை மாற சிறுபான்மையினராகிய நமது நலம் பாது காக்கப்பட வேண்டும். கைத்தறி நெசவுத் தொழில் புரிவோர் ஓரணியில் நிற்க வேண்டும். உணர்வின் அடிப்படையில் ஒன்று திரண்டு சமூக நலம் காக்கும் பாசறையாக மாறவேண்டும். நம் சமுதாயத்தில் நன்றாகவும், திறமையாகவும் படிக்கக் கூடிய எத்தனையோ மிகுந்த புத்தி கூர்மையுள்ள மாணவ, மாணவிகள் இருந்தும் அவர்கள், மருத்துவம், பொறியியல் போன்ற தொழிற் படிப்பிற்கு தங்களின் குடும்ப பொருளாதாரத்தின் காரணமாக போக முடியவில்லை. அத்தகைய மாணவர்கள் தங்கள் படிப்பை பத்தாம் வகுப்பு வரையிலோ அல்லது பன்னிரண்டாம் வகுப்பு வரையிலோ நிறுத்தி கொள்கிறார்கள். இதுபோன்ற மாணவ, மாணவியருக்கு போதிய பண வசதி செய்து கொடுக்கப்பட வேண்டும். இதற்கென கல்வி நிதி அமைப்பை ஏற்படுத்த வேண்டும். இந்நிதிக்கு நமது இன மக்களிடம் நன்கொடைகள் வசூலிக்கலாம்.

நம் இன மக்களுக்கு உதவிட புத்தக வங்கிகள் ஏற்படுத்தலாம். தற்போது தாங்கள் செய்யும் தொழிலை விட்டுவிட்டு மாற்றுத் தொழிலை நாடலாம். தற்போது நவீன முறையில் இயங்கிவரும் அச்சுத்தொழில், கணிபொறியியல் துறையில் நாட்டம் செலுத்தலாம். வங்கிகள் மூலம் அளிக்கப்படும் கடன்களை பெற்று நெசவாலைகள் ஏற்படுத்தலாம்.

நம்முடைய சமுதாயத்தின் சார்பில் கல்விச் சாலைகள் அமைத்து, நம்மவர்களுக்கு முதலிடம் அளித்து அவர்களை கல்வியில் சிறந்தவர்களாக திகழச் செய்யலாம்.

நம்முடைய சமுதாயத்தை சேர்ந்தவர்கள் தொழிற் சாலைகளை நிறுவி அதன் மூலம் வேலையில்லா திண்டாட்டத்தை போக்கலாம்.

நம்முடைய சங்கத்தின் மூலம் சுயத்தொழில் புரிய எண்

ணமுள்ளவர்களை ஊக்கப்படுத்தி வங்கிகள் மூலம் கடன் பெற்றுத் தர முயற்சிக்கலாம்.

மேலும் எங்களின் சமுதாயத்தை மிகவும் பிற்படுத்தப் பட்டோர் பட்டியலில் சேர்ப்பிப்பதின் மூலம் தமிழக அரசின் இட ஒதுக்கீட்டில் எங்கள் இன மாணவ, மாணவியருக்கு சற்று கூடுதல் ஒதுக்கீடு கிடைக்க வாய்ப்பு உள்ளது. இதை பயன்படுத்தி அவர்கள் கல்வித் துறையில் சிறிது முன்னேற்றம் அடைய வாய்ப்புக்கள் உள்ளன. அவ்வாறு கல்வியில் முன்னேற்றம் அடைந்தவர்கள் அரசின் உயர் பதவிகளாகிய ஐ.ஏ.எஸ்., ஐ.பி.எஸ். போன்ற பதவிகளிலும், அரசின் உயர் பதவிகளிலும் அங்கம் வகிப்பார்கள் என்பது எங்களது எண்ணம்.

மேற்கண்ட கனவுகளை நினைவாக்க தேவையான நடவடிக்கைகளை மாநிலச் சங்கம் எடுத்து வருகிறது.

தமிழ் - 20

மாறிவரும் சூழ்நிலைகளில் கைத்தறி

சி.இராமலிங்கம்,

அனகாபுத்தூர்

தமிழ்நாட்டில் கைத்தறியில் நெய்த துணிகளில் வேலைப்பாடும், மேன்மையைக் கொண்டதும், மதி நுட்பத்துடன் சிந்திக்கும் திறமையும் கொண்டு செயல்பட வேண்டும். 1900 ஆண்டுகளில் துணிகள் நெய்தவிதம், பாவுநூலை புணி மெரித்து அதனால் உண்டாகும் சந்தில் ஊடைநூல் சுற்றி உள்ள நாடாவை (ஓடம்) வலது பக்கம் இருந்து கையால் வீசி எரிந்து, இடது பக்கம் வரும். அதனை இடது கையால் பிடித்து மீண்டும் புணிமெரித்து இடது கையால் எரிந்து வலது பக்கம் வரும் நாடாவை வலது கையால் பிடித்தும், இதேபோல் காலை முதல் மாலை வரையில் செய்து வந்தால், அதில் உருவாகும் ஆடை தான் துண்டு என்றும், வேட்டி என்றும், சேலை என்றும், ருமால் என்றும், அங்கவஸ்திரம் என்றும் பெயர் வைத்து பொது மக்களுக்கு வழங்கி வந்தார்கள். நாடாவை கையால் எரியப்பட்டு துணி நெய்து வந்த முறையை ஆங்கிலேயர் நாட்டில் லங்காஷியரில் இயந்திரத் தறிகள் மூலம் துணி உற்பத்திச் செய்வது அறிந்து கொண்டு, சென்னை மாநகரில் வண்ணாரப்பேட்டையில் வாழ்ந்து வந்த ஸர்.பி.டி. தியாகராயச் செட்டியார் என்பவர் (பின்னாளில் சென்னை மாநகராட்சி மேயராக இருந்தவர்) தோல் பதனிடும் தொழிலும், கைத்தறித் துணியும் உற்பத்திச் செய்து லண்டன் மாநகருக்கு ஏற்றுமதி செய்து வந்தவர். அவர் மரச்சட்டங்களை இணைத்தும், அவைகளில் கயிறுகள் கட்டியும், குத்திரங்கயிறு கொண்டும் கைப்பிடி அமைத்து கயிரை இழுத்தால் நாடா (ஓடம்) தானாக வலமிருந்து இடமும், இடமிருந்து வலமும் செல்கின்ற முறையைக் கண்டுபிடித்தார். அந்தக் கைத்தறிகளுக்கு செட்டில் தறி என்றும், டேபிள் தறி என்றும் பெயர் வந்தது. பல ஆண்டுகளுக்கு முன் வண்ணாரப்பேட்டை தறி என்று தான் சொல்லி வந்தார்கள்.

கையினால் நாடாவை எரிந்து துணிகள் நெய்த நாட்களில் தென்னாற்காடு வள்ளலார், வடாற்காடு, செங்கற்பட்டு மாவட்டங்களில் அன்னிய நாடுகளான பர்மா, மலேசியா, இந்தோனேசியா, ஜாவா, சுமத்திரா போன்ற கீழ்திசை நாடுகளுக்கும், அரேபிய நாடுகளுக்கும் துணிகள் ஏற்றுமதி செய்யப்பட்டுள்ளது. அப்போது போர்ச்சுகீசியர்கள் தென்னாட்டில் இருந்தபோதும், அதன்பிறகு பிரெஞ்சுக்காரர்கள், வெள்ளையர்கள் ஆண்ட காலத்திலும், பழுவேற்காடு என்ற துறைமுகத்திலிருந்துதான் கைத்தறித் துணிகள் மற்ற வாசனைப் பொருட்கள் ஏற்றுமதிச் செய்யப்பட்டு வந்தார்கள். கீழ்திசை நாடுகளில் இன்றும் கைத்தறிச்சாரம் என்று அழைத்து வருகின்றார்கள். பழுவேற்காடு துறைமுகத்திலிருந்து வந்ததால் அந்தப் பெயர் ஏற்பட்டது. வெளிநாடுகளுக்கு ஏற்றுமதி செய்த துணிகளின் பெயர்கள் தாப்பித்தா, குஞ்சாலி, பர்மா சாரம், கைலிகள், லுங்கிகள் என்பார்கள். ருமால் என்ற துணியும் மூட்டு என்கின்ற துணியும் அரேபிய நாடுகளுக்கு ஏற்றுமதி செய்து வந்தார்கள். செட்டில் தறிகள் வந்த பிறகு கைத்தறியில் துணி உற்பத்தியில் பல மாற்றங்கள் வந்தது.

கீழ்திசை நாடுகளிலும், இலங்கை, அரேபியா நாடுகளில் அங்குள்ள பொது மக்கள் விரும்பியும், பண்டிகை காலங்களிலும் அணியும் உடைகள், கைலிகள்தான். அவைகள் 50' (இன்ச்) அகலத்தில் இரண்டு மீட்டர் நீளம் கொண்டவை. 40 x 40 எண் நூல் 60 x 40 எண் நூல், 60 x 60 எண் நூல், 80 x 60 எண் நூல், 80 x 80 எண் நூல்களில் நெய்யப்படுகின்றது. ஐந்து கலர்கள் உள்ள கட்டங்கட்டிய துணிகள் பல ரகங்களிலும் தயாரிக்கப்படுகின்றது. கைத்தறி நெசவு என்பது கோழி முட்டை போல் துணி வழுவழப்பாக இருக்கும் தண்ணீரை முகர்ந்தால் கீழே தண்ணீர் ஒழுகாது, கசியும். இத்தகைய

துணிகளை நெய்ய முடிகின்றது. செட்டில் தறிகளால் குஞ்சாலி, தாப்பித்தா என்ற துணிகளில் இரண்டு கலர், மூன்று கலர்களில் கட்டங்கள் அமைத்து கையால் நாடா வீசிய காலத்தில் இந்த ரகத்துணிகள் மெல்லியதாக கிளாஸ்கோ மல் போன்று அமைப்பில் துணிகள் இருக்கும். இந்த ரகங்கள் பார்டரில் கலர்கள் கோர்த்து வாங்குவார்கள். காஞ்சிபுரம் கோர்வைச் சேலைகள், தாப்பித்தா, குஞ்சாலி ரகத்தின் மூலம் வந்ததுதான் சைனா நாட்டிலிருந்து நம் நாட்டிற்கு மல்பரி பட்டு நூல் பாவாகவும், ஊடையாகவும் விற்பனைக்கு வந்த போது நம் நாட்டில் வியாபாரிகளும், கைத்தறி நெசவுத் தொழிலாளர்களும் பட்டுக்குச் சாயம் போட்டு தாப்பித்தா, குஞ்சாலி ரகத்தில் புனைந்து செய்த துணிகள்தான் பெண்களுக்கு பட்டுச் சேலையாகவும் மாறியது. அந்த நாட்களில்

முகம்மதியர்கள் நாமும் ஆண்களும், பெண்களும் ஒரே மாதிரியான உடைகளை உடுத்தி உள்ளார்கள். அதற்கு எடுத்துக் காட்டாக கேரள மாநிலத்திலும், அசாம் பகுதியிலும் ஆண்கள், பெண்கள் இருவரும் வேட்டி, முண்டு அணிகின்றார்கள்.

தென்னாட்டில் வாழும் கைத்தறி நெசவாளர்களின் முன்னோர்கள் கண்டுபிடித்து நெய்த துணிகள் வேலைப்பாடுகள் அமைந்த துணிகளில் சரிகைகள் கலந்தும், புட்டாக்கள் பூக்கள், பறவைகள், மான், புலி, சிங்கம், யானை போன்ற உருவங்களும், கடவுள்களின் உருவங்களும் பதிக்க கைத்தறித் தொழிலில் வல்லுனர்களாக இருந்து வந்துள்ளார்கள். இந்த கைய பாரம்பரியமிக்க தொழிலுக்கு இந்த நிறுவனம் பலம் பயக்கும் செயல்களை செய்து காப்பாற்ற வேண்டுகிறேன்.

தமிழ் - 21

சிதைவை நோக்கி சிற்பக் கலைப்பணிகள்!

எஸ்.பெருமாள் ஸ்தபதி,

மாமல்லை

பல நூறு ஆண்டுகளாகத் தமிழ்நாடு கல்லால் ஆன கோயில் கட்டிடங்களுக்கும், சிற்பங்களுக்கும் புகழ் வாய்ந்த மாநிலமாகும். சிறப்பாக கருங்கல்லால் செய்யப்படும் கட்டிடங்களும், சிற்பங்களும் தென்னாட்டில்தான் காணப்படுகிறது என்று சொன்னால் மிகையாகாது. இந்திய நாட்டை ஆண்டுவரும் அரசுகள் அயல்நாட்டினரை அழைத்து வந்து காட்டி பெருமை கொள்வதெல்லாம் கல்லால் ஆன சிற்பங்களும், கட்டிடங்களும் என்றால் மிகையாகாது.

கல்லைப் பொறுத்தவரையில் தமிழ்நாட்டிலே கிடைக்கும் கற்கள்தான் சிற்பக் கலைக்கு ஏற்ற கற்கள் என்று அறிஞர்களும், கலைஞர்களும் அறிவார்கள். இந்த நிலையில் தமிழ் நாட்டில் திருவண்ணாமலை, செங்கை அண்ணா மாவட்டத்தில் சங்கராபுரம் என்னும் கிராமத்தில் திருச்சி மாவட்டத்தைச் சேர்ந்த பெரம்பலூரில் திருநெல்வேலி மாவட்டத்தில் அம்பா சமுத்திரத்தில் கிடைக்கும் கற்கள்தான் மிகச் சிறந்த கற்கள் என்று விவரம் அறிந்தோர் பேசுவர். இவற்றில் உலகத்திலேயே உயர்ந்த ரகமான கற்கள் மேற்சொன்ன சங்கராபுரத்தில் கிடைக்கின்றது. அடுத்ததாகத் திருவண்ணாமலையில் வைரக் குன்று என்ற ஒரு மலையில் கிடைக்கிறது. இந்த மலையிலிருந்துதான் உலகப் புகழ் வாய்ந்த வள்ளுவர் கோட்ட திருப்பணியானது நடைபெற்றது.

தற்காலத்தில் சிமெண்டு சாந்தினாலும், செங்கல்லாலும் கோயில் கட்டும் பணி குறைந்து கல்லாலேயே அவைகள் செய்யப்பட வேண்டும் என்ற விருப்பமும், ஒரு திருப்பமும் ஏற்பட்டிருப்பதை எவரும் காணலாம். மாமல்லபுரத்தில் மட்டும் 150 கருங்கல் பட்டறைகள் நடந்து வருகின்றன. இதே போல் பல இடங்களில் தென்னாட்டில் பட்டறைகள் நடந்து வருவதோடு பெரும் திருப்பணிகளும் நடந்து வருகின்றன. தொழில் நிலையில் நல்ல வளர்ச்சியும், உயர்வும் காண வேண்டிய நேரத்தில் மேலே குறிப்பிட்ட மலைகளிலிருந்து

கற்கள் கொண்டு வந்து தொழில் செய்வது இப்போது முடக்கப்பட்டிருக்கிறது என்று சொல்ல விரும்புகிறேன். கல்லை நம்பி வாழ்ந்து இடைகாலத்தில் கற்பணிகள் இல்லாது தேய்ந்து இப்போது கற்பணிகள் ஏற்பட்டபின் கல் கிடைக்காது தொழில் செய்யும் சிற்பிகள் மீண்டும் தேய்வை நோக்கி செல்லத் தொடங்கி இருக்கிறார்கள். இந்த ஆண்டில் இந்த அவலநிலை வருணித்து மாளாது. சிற்பத் தொழிலுக்கு அரசின் ஆதரவு நேரடியாக இல்லாவிட்டாலும் பொது மக்களின் ஆதரவு பெருகிவரும் இந்நிலையில் சிற்பிகளுக்கு இந்த அவலநிலை ஏற்படலாமா?

மேற்சொன்ன இடங்களில் சிற்பப் பணிகளுக்கென்றே பல நூறு ஆண்டுகள் ஒதுக்கி வைக்கப்பட்டு அதை நம்பிப் பல குடும்பங்கள் மலைகளைச் சுற்றியே வாழ்ந்து இப்போது அவர்களும் செல்ல இடமின்றி வாய்முடி மௌனிகளாகி விட்டனர்.

ரோடு ஜல்லி எடுப்பதற்கு வேறு மலைகள் தமிழ்நாட்டில் இல்லையா? குண்டுக் கற்கள் உடைப்பதற்கு இந்த மலைகள் தான் கிடைத்தனவா? இவற்றை எடுப்பதற்கு உரிமை வழங்கிய அரசு பெரிய கலைப்பணிகள் செய்வதற்கு நீண்ட கற்கள் எடுப்பதற்கும், கொண்டு வருவதற்கும் செயற்கையான பல விதிமுறைகளை சிற்பிகளாகிய எங்களை கலந்து ஆலோசனை செய்யாமல் விதித்து பலரை தண்டித்து இம்சைக்குள்ளாக்கி கேவலப்படுத்துவதோடு கலைப்பணிகளின் வளர்ச்சியை தடை செய்யலாமா? இதனை மத்திய அரசும், மாநில அரசுகளும் உடனடியாக கவனிக்க வேண்டும். கலைப்பணிகளுக்காக இந்த மலைகளையெல்லாம் ஒதுக்கி வைத்து ஏற்றுமதி பணிகளுக்கு இவற்றைப் பயன்படுத்தாது விதிமுறை செய்து சிற்பிகளின் வாழ்விற்கு உதவி செய்ய வேண்டும் என்று இந்த மாநாட்டில் பெரியோர்களைப் பணிந்து கேட்டுக் கொள்கிறேன்.

வள்ளுவர் விளம்பும் நலவாழ்வு

டாக்டர் சு.மு. இராசன்

N.D. நலவாழ்வு சேவை மையம்,

பட்டாபிராம்

நலவாழ்வு! அப்படியெனில் இன்றைய மனிதனின் வாழ்வு நலமாக இல்லையா? உண்மையினைச் சொன்னால் மனிதன் ஆரோக்கியமாக இல்லாததால்தான் உலகில் நடைபெறும் இன்றைய அனைத்துச் சீரழிவுகளுக்கும் காரணமாகி, 'தேவனின் சாயலிலே மனிதன்' என்ற உன்னத நிலையில் இருந்து வீழ்ந்து 'மனிதன் மிகச் சுகாதாரமான விலங்கு' என்ற அடைமொழிகளைத் தாங்கி இழிநிலையில் இருந்து கொண்டிருக்கின்றான். இன்றைய நாளில் அறிவியல் வெகுவாக வளர்ச்சி அடைந்துள்ள நிலையில், மனிதனின் வாழ்வினை எய்ட்ஸ் போன்ற நோய்கள் அச்சுறுத்திக் கொண்டிருக்க, அவற்றை குணப்படுத்திட மருத்துவ அறிவியல் இன்னும் தீர்வு கண்டிராத நிலையில் கையில் எழுத்தாணி, ஒலைச்சுவடியுடன் தோற்றம் அளித்திடும் திருவள்ளுவரால் மனிதனின் நலவாழ்விற்கு வழிவகை கூறிட இயலுமா எனில், நிச்சயம் திருவள்ளுவர் போன்ற சான்றோரால் மட்டுமே இயலும்.

நலவாழ்வு என்றவுடன் நம் நினைவிற்கு வருவது நோயற்ற உடல் நிலை என்பதனை அனைவரும் ஒப்புக் கொள்வோம். நோயினைக் குணப்படுத்துவதில் மருத்துவர் என்ற பாத்திரம் மிகவும் முக்கியமான பங்கினை வகிக்கின்றது. ஆனால், மருத்துவர் என்பதன் சரியான பொருளினை மனிதகுலம் அறிந்துள்ளதா எனில் அது சந்தேகமாகவே உள்ளது. ஆம், மருத்துவர் என்பவர் மருந்து கொடுப்பவர், ஊசி குத்துபவர், அறுவை சிகிச்சை செய்கின்றவர் என்பது சரியான பொருள் இல்லை. மருத்துவர் (Doctor) என்பது Docky என்ற கிரேக்க வார்த்தையில் இருந்து வந்ததாகும். அதன் பொருள் யாரொருவன் ஆரோக்கியத்தினைச் சொல்லிக் கொடுக்கின்றானோ அவன்தான் மருத்துவன் (Doctor).

அடுத்து ஆரோக்கியம். ஆரோக்கியம் என்பது நோய் மறைந்த நிலை, நோயற்ற நிலை என்றால் அதுதான் இல்லை. காரணம், இன்றைய நிலையில் பாதுகாப்பு என்ற பெயரில் மனிதனைக் கொல்ல மனிதனைக் கொண்டே, மனிதனால் தீட்டப்படும் திட்டங்களைச் செய்திடும் மனிதனை ஆரோக்கியமான உடல்நிலையினை உடையவன் எனச் சொல்லிட இயலுமா? அல்லது மனிதனின் வாழ்வில் முக்கிய பங்கு வகிக்கும் பெண் இனம், பெண் சிசுக்கொலை, வன்முறைகளால் குறையாடப்படுவதற்குக் காரணமான மனிதனை ஆரோக்கியமான உடல் நிலையினை உடையவன் எனச் சொல்லிட இயலுமா? அல்லது மனித வாழ்வே நிலையில்லாதது என்று அறிந்தும் இப்புவியினைத் தனதென சொந்தமாக்கிக் கொள்ளும் வண்ணம் எப்படி மீன் தன் உறைவிடமான நீரினை மாசுபடுத்தினாலோ அல்லது நீரினை இல்லாது செய்தால் அழிந்துபட்டு போகுமோ அதுபோல மனிதனின் மட்டுமல்லாது அனைத்து உயிரினங்களுக்கும் உரிமையுள்ள காடுகளை அழித்தும், சுற்றுப்புறத்தினை மாசுபடுத்தியும் வரும் மனிதனை ஆரோக்கியமான உடல்நிலையினை உடையவன் எனச் சொல்லிட இயலுமா? மேற்சொன்னவற்றில் ஈடுபடும்

மனிதர்களை அறிவியல் சோதனைகளுக்கு உட்படுத்தினால் உறுதியாக யாருக்கும் சர்க்கரை நோய் இருக்காது. இரத்த அழுத்தம் இருக்காது. எய்ட்ஸ் இருக்காது. இன்னும் வேறெந்த நோயும் இருக்காது. ஆம். ஆரோக்கியம் என்பது வெறுமனே நோய் மறைந்த நிலை மட்டுமன்று. உலக சுகாதார நிறுவனம் கூறியுள்ளபடி ஆரோக்கியம் என்பது வெறுமே நோய் மறைந்த நிலையன்று. ஒருவனின் உடல், மன மற்றும் சமூகத்தில் ஈடுபடும்போது உள்ள நல்ல மனித நேயத்தினை உடைய உடல்நிலை கொண்ட நிலையே ஆரோக்கியமாகும்.

மேற்சொன்னவற்றிற்கு காரணம் என்ன? அவற்றை சரி செய்ய இயலுமா? என்ற கேள்விகளுக்கு விரிவான விளக்கம் கட்டுரை அளிக்கப்படும். காரணம் மலச்சிக்கலே. மலம் இருவகைப்படும். ஒன்று உடல் மலம் என்பது. மற்றொன்று மனமலம் என்பது. மனமலம்தான் மேற்சொன்ன அனைத்திற்கும் காரணம். அது என்ன மன மலம் (கசடு). அதுதான் நான் என்ற ஆணவ மலம். நான்மறைகள் (வேதங்கள்) அனைத்தும் கடவுள் என்ற ஒன்றினைப் பற்றி வலியுறுத்துகின்றதோ இல்லையோ ஆனால், அவை அனைத்தும் 'நான்' என்ற ஆணவக் கசடு, ஆணவ மலம் முழுமையாக மறைந்து, அற்று இருத்தலையே வலியுறுத்துகின்றன. இதனையே திருவள்ளுவர் 'காமம் வெகுளி மயக்கம் இவை மூன்றன் நாமம் கெடக் கெடும் நோய்' என்று நோய் முற்றிலுமாக மறைந்த, இல்லாத நிலை அல்லது முழுமையான ஆரோக்கிய நிலை எனக் கூறுகின்றார். இந்தக் காமம், வெகுளி, மயக்கம் இவை மூன்றுக்கும் காரணம் என்னவெனில் 'நான்' என்ற தன் முனைப்பே அகங்காரமே யாம். ஏன் இந்த 'நான்' என்ற கசடு அற்று இருக்க வேண்டும்? மனிதனை விடுத்து மற்ற விலங்குகளும், பறவைகளும் தங்களின் வாழ்க்கையினை சந்தோஷமான ஒன்றாக நடத்திடும் வேளையில் மனிதன் மட்டுமே போராடிக் கொண்டிருப்பதற்கு காரணத்தினை நாம் சற்று உற்று நோக்கினால் ஒரு உண்மை புலப்படும். அது மற்ற விலங்குகளிலும், பறவைகளிலும் ஒவ்வொன்றும் அதனதன் தனித்துவத்துடன் (Self individuality) வாழ அனுமதிக்கப்படுகின்றன. மனிதனும் ஒவ்வொருவனும் சுதந்திரமாக அவனவன் தனித்துவத்துடன் வாழ அனுமதித்தால் மனித வாழ்வு வளப்படும். ஆம்; மனிதன் மட்டுமே பிறக்கும்போது குழந்தையாக, ஞானியாக, முழுமையானவனாக பிறக்கின்றான். ஆனால், இறக்கும் போது ஒரு கிறித்துவனாகவோ, ஒரு இந்துவாகவோ, ஒரு இஸ்லாமியனாகவோ அல்லது வேறு ஏதோ பிளவுபட்டு விட்ட நிலையிலோ ஆனால் மனிதன் அல்லாத ஒன்றாகவே தன் வாழ்வினை முடிக்கின்றான். ஆக, ஏ மனித குலமே, கீழை நாடுகளின் அறிவியல், நான்மறைகள் சொன்னபடி தன்னை அறிதல் மூலம் 'நான்' என்ற ஆணவக் கசடின் நாமம் முழுமையாக அழிந்து மனிதனால் இம்மண்ணில் உலவி வருவீராக! அவரே கடவுளின் சாம்ராஜ்ஜியத்தில் உலவி, உயிர் வாழ்ந்திட தகுதியுடையவராவர். வாழ்க்கையின் அர்த்தமும் அதுவேயாம்.

மரபுசார்ந்த பட்டு கைத்தறி நெசவு

கே.எஸ். ராமமூர்த்தி பி.ஏ.,

தலைவர்,

கும்பகோணம் கைத்தறி பட்டு ஜவுளி உற்பத்தியாளர்கள் சங்கம்

பட்டு சேலை என்றதும் காஞ்சிபுரம் நம் நினைக்கு வரும். காஞ்சிபுரம் பட்டுச் சேலைகள் தமிழ்நாட்டில் மட்டு மல்லாமல் உலகில் எங்கும் தமிழர்கள் இடையே ஒரு முக்கிய மான அந்தஸ்தை பெற்றிருக்கிறது. பட்டுச் சேலை அணிந் தாலே தனி கௌரவம் ஏற்படுகிறது.

இதற்கு காரணம் பட்டு நெசவின் நேர்த்தியும், பார்டர், முந்தி மற்றும் உடலில் ஜரிகை வேலைப்பாடுகளும், கலரும் பளபளப்பும் பட்டுச் சேலைக்கு ஒரு அலாதிமான வனப்பை உண்டாக்குகின்றன.

காஞ்சிபுரம் பட்டுச் சேலைகள், காஞ்சிபுரத்தில் மட்டு மல்லாது, கும்பகோணம் தஞ்சாவூர் ஆகிய ஊர்களிலும் தயா ராகின்றன. ஆரணியிலும் தயாரிக்கின்றனர்.

கும்பகோணம், (திருபுவனம் உள்பட) தஞ்சாவூர், பட் டுச் சேலைகள், காஞ்சிபுரம் பட்டுச் சேலைகள் என்று விற்கப் படுகின்றன.

இத்தகைய பட்டுச் சேலைகள் நெய்வதில் பட்டு நூல்கா ரர்கள் என்று அழைக்கப்படும் சௌராஷ்டிரா சமூக மக்கள் முதன்மை பெற்று விளங்குகின்றார்கள்.

ஆண்டுதோறும், தேசிய அளவிலும், மாநில அளவிலும் டிசைன் வடிவமைப்பிலும், ஆடை நெய்வதிலும், வேலைப் பாடுகளுக்கும் பரிசு பெற்றவர்கள் பெரும்பாலும் சௌராஷ்டிரார்களே.

பட்டு நெசவு செய்ய சர்கா, கோறா பாவு, ஜரிகை, சாய பவுடர் ஆகியவை மூலப் பொருள்களாகும்.

பட்டு புழுக்களிலிருந்து இழை எடுத்து கோளா உற்பத்தி செய்யப்படுகிறது. கை ராட்டினம் மூலம் உற்பத்தி செய்யப் படுவது சர்கா என்றும், இயந்திர மூலம் உற்பத்தி செய்யப்படு வது பிலேச்சர் என்றும் சொல்லப்படுகிறது.

இந்த கோறா முறுக்கு போட்டு பாவாகவும், சப்புரி ஆக வும் தயாராகிறது. சப்புரி உடை நூல் நெய்வதற்கு உபயோகப் படுகிறது.

கோறாவை சோடா ஆஷ் அல்லது சோப்பு கலவையில் கொதிக்க வைத்து பிசினை நீக்குகிறார்கள். பின்னர் சாயம் ஏற்றுகிறார்கள்.

ஜரிகை குரத்தில் தயாராகி வருகிறது. இதை பாவாக வும், கண்டு சுற்றியும் பார்டருக்கு உடல் மற்றும் முந்தி வேலைப்பாடுக்கும் உபயோகிக்கிறார்கள்.

ஜாக்காட் எனப்படும் பொறியை பார்டர் உடல் டிசைன் முந்தி டிசைன் நெய்வதற்கு உபயோகப்படுத்துகிறார்கள்.

தறியை நெசவாளியே மரபுப்படி மேடை அமைத்தோ, குழி பறி அமைத்தோ அழைத்து கொள்கிறார்.

சாயம் ஏற்றிய பாவை பண்ணை அல்லது அச்சு எனப் ப்டும் மூங்கில் அல்லது அகனி பல் வழியாக புணைத்து தறி நீட்டப்பட்டு நெய்வதற்கு தயாராகிறது. பட்டு சேலைகள் ஒரு பக்கம் கரை, இரு பக்க கரை ஆக தயாரிக்கப்படுகிறது.

கும்பகோணம், தஞ்சாவூர் பட்டுச் சேலைகள் பெரும்பா லும் ஒன்சைடு பார்டர் ஆக தயாரிக்கிறார்கள். நெசவாளர் பற்றாக் குறையே இதற்கு காரணம்.

தறி நெய்ய இருவர் தேவை. பிரதம நெசவாளி ஒருவ ரும், உதவிவாளர் பெரும்பாலும் 12 வயதிற்குட்பட்ட பயன் அல்லது பெண்ணாக இருப்பார்.

(பட்டு பூச்சியிலிருந்து பட்டு எடுப்பது கர்நாடகாவில் பெருமளவில் நடந்து வருகிறது. நம் நாட்டில் பட்டு தேவை யில் 80 சதம் கர்நாடகா பூர்த்தி செய்கிறது. தமிழ் நாட்டிலும் பட்டு உற்பத்தியை அரசாங்கம் ஊக்குவித்து வருகிறது).

இந்த பட்டுச் சேலைகள் தமிழ் நாட்டிலும், தமிழர்களும் வாழும் இதர நாடுகளில் மட்டும் விரும்பப்படுகிறது.

பட்டு துணிக்கு ஏற்றுமதி வாய்ப்பு பிரகாசமாக இருப்ப தால் ஏற்றுமதி ரகம் தயாரித்து விற்க மத்திய மாநில அரசுகள் உதவி செய்தால் நெசவாளர்கள் வாழ்வு ஒளிமயமாகும் என் பதில் ஐயமில்லை.

கைத்தறியில் உற்பத்தியாகும் ரகங்கள் உள் நாட்டு தேவைக்கு ஏற்றவை. விசைத் தறியில் ஏற்றுமதிக்கான ரகங் களை தயாரிக்கலாம். இதன் மூலம் பாரம்பரிய பட்டு நெசவு தொழில் பழமையும் புதுமையும் கலந்து நெசவாளர்கள் நல்ல பொருளாதார முன்னேற்றம் காண முடியும்.

கைத்தறி விசைத்தறி முன்னேற்றத்திற்கான அரசாங்கத் திட்டங்களில் (திட்டமிடுதல் - அமுலாக்கம் - கமிட்டிகள் - தொழில் நுட்பம் - ஆகிவற்றில்) தனியாருக்கும் தக்க இடம ளிக்க வேண்டும்.

இன்றைய நிலையில் அரசாங்கம் திட்டங்கள் அதிகாரி கள் நிலையிலே அமைந்து வருகின்றன. தனியார் துறை அவற்றை அறிய முடியாமல் போய்விடுகிறது.

மரபுத் தொழில் சார்ந்த சமூக இளைஞர்கள் மேற்படி கல்வி கற்று தங்களுடைய எதிர் காலத்தையும், சமூகத்தில் எதிர்கால கனவுகளையும் இன்றைய சூழ்நிலைக்கு முன்னேற் றள் காணவும் மத்திய அரசும், மாநில அரசும் உதவி செய்ய வேண்டும்.

சுடுமண் பொம்மைகள்

கே.எஸ். கனியன்

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மண்மான் நுழைபுலம் இல்லான் எழில்நலம்
மண்மான் புனைபாவை அற்று

என்கிறார் திருவள்ளுவர். சுடுமண் பாவை அவர் மனதைக் கவர்ந்ததா? அன்று. சில மனிதர்களின் மந்தகுணம்தான் எரிச் சலையூட்டியுள்ளது. எப்படியாகிலும் மண்ணில் செய்த பொம்மை மனிதனைப் போலவே தத்ரூபமாக உள்ளது.

மனிதனுக்கேதேனும் உடல் நலக்குறை வந்தால், உள் ளார் மாரியம்மனுக்கு வேண்டிக் கொள்கிறார்கள். அதன்படி, அவன் நலம் பெற்றதும், திருவிழாவின் போது உருவாரம் செய்து வைக்கின்றனர். ஆடு, மாடு போன்றவையும் ஏராளம். பாம்பின் தொல்லையிலிருந்து தப்பியோர் படம் எடுத்தாடும் பாம்பின் வடிவையும் செய்து வைக்கிறார்கள். விவசாயிகள் நிறைந்த தமிழ்நாட்டில் மாட்டுப் பொம்மைகள் மிக அதிகம் காணலாம். மோகனூர் அருகில் உள்ள ஆரியூர் என்ற கிராமத் தில் ஒவ்வொரு ஆண்டும் ஐம்பதிற்கும் மேற்பட்ட மாடுகள் செய்து திருவிழாவில் கோயிலில் நிறுத்துகின்றனர்.

மக்கள் தனித்தனியாகத் தம் செலவில் செய்து வைக்கும் உருவாரங்கள் தவிர, கோயில் செலவிலேயே பெரிய அரண் மனைக் குதிரை ஒன்று செய்து வைப்பர், 10 முதல் 15 அடி உயரமுள்ள பெரிய குதிரை. ஆண்டுக்கொன்றாக வைக்கப்பட டும் குதிரைகள். கோயிலில் நூற்றுக்கணக்கில் சேர்ந்துவிடும். திருக்கோவலூர் வட்டத்தில் அரியூர் ஏரியின் வயற்பகுதியில் இவ்வாறு நூற்றுக்கணக்கான குதிரைகள் இருப்பதைக் காண லாம்.

தென்னாற்காடு, புதுவைப் பகுதிகளில் வீரன் கோயில் கள் ஊர்தோறும் இருக்கும்.

சேலம் மாவட்டத்தில் முனியப்பன் கோயில்கள் மிக அதிகம். 20 அடி உயரத்திற்கு மேற்பட்ட முனி, முனியம்மா சாதாரணம், இராசிபுரத்திற்கு அருகிலுள்ள கீழ் மாவிலங்கை அம்மன் கோயில் முனி பாதம் முதல் கிரீடம் வரை 20 அடிக்கு மேல் இருக்கும். ஊர்க்காவல் இம்முனிவர்கள் பொறுப்பு உருட்டிய விழிகளும், உருவிய வாளும் தவறிழைத்தோர் குடலில் புளி கரக்கை.

தென்னாற்காடு புதுவைப் பகுதிகளில் ஏழு முனிகள் வரிசையாகக் கம்பீரமாக அமர்ந்திருப்பதைக் காணலாம். ஒருத்தர் கையில் வாள், ஒருத்தர் கையில் சுவடி, ஒருத்தர் கையில் வீணை ஆகியவை இருக்கும்.

அத்தனையும் களிமண்ணால் செய்து கட்ட பொம்மை

கள், காலத்தை விஞ்சி நிற்கின்றன. கருங்கல் கோவில்கள் வானளாவி எழுகின்ற போதிலும் சுடுமண் எதிர்நீச்சல் போடு வது எவ்வாறு? இந்தப் பொம்மைகளைச் செய்யும் கலைஞர் கள் யார்? அவர்களின் சமுதாய நிலை என்ன? இத்திறன் படைத்தோர் தற்போதும் உள்ளனரா? சுடுமண் தொழில் நுட் பம் இன்றும் வலுவோடுள்ளதா? மாறிவரும் சமுதாயப் பொருளாதாரச் சூழலில், இம்மரபுகள் தொடருமா?

இது போன்ற பல கேள்விகள், அவ்வப்போது மக்கள் மனதில் அரும்பி மலர்வதுண்டு.

சுடுமண் பொம்மைகள் செய்யும் தொழிலில் ஈடுபடு வோர் இன்னும் மரபு வழியாக வந்த குயவர் பெருங்குடி மக்களேயாவர். விழுப்புரம் வட்டத்தில் பம்பையாற்றின் கரையில் அய்யன்கோயில்பட்டு உள்ளது. பொம்மை செய் வதே இந்த ஊரில் பெரும்பாலானவர்களின் பணி. இங்கு மண் பொம்மை செய்வதோடு காகிதக் கழிவிலும் பொம்மை செய்கின்றனர். பொம்மைத் தொழில் செய்வதற்குப் பயிற்சி யும் அளிக்கிறார்கள். சுடுமண் பொம்மைக் கலை அண்மைக் காலத்தின் அரசின் ஊக்குவிப்பைப் பெற்று வருகிறது. தேசிய விருதும் புதுச்சேரி அரசின் விருதும், சென்னையில் உள்ள விக்டோரியா கலைக்கழகத்தின் பரிசு பெற்றுள்ளார்கள்.

விழுப்புரம், திண்டிவனம் இடையே வீரர் அணை உள் ளது. தேசிய நெடுஞ்சாலை அருகில் 15அடி உயரமேடை மீது ஏழடி உயர சுடுமண் மயிலைப் பொதுப்பணித்துறையினர் வைத்துள்ளனர். "வான்மழை நாடும் வண்ண மயில்" என்று பெயர் வைத்துள்ளனர். இச்சிலையை வடிவமைத்து உரு வாக்க ஆணையிட்டவர் விழுப்புரம் கோட்டச் செயற்பொறி யாளர் டாக்டர் கொடுமுடி சண்முகனார் சிலையைச் செய்த வர் அய்யன்கோயில்பட்டு பலராமன் என்ற கலைஞர் ஆவார். ஐந்து தலை நாகம் ஒன்றும் இவர் செய்து கொடுத்துள்ளார்.

தொழில் நுட்பம்

ஏரிகளில் படியும் வண்டல் மண் பொம்மை செய்வதற் கும் மண்பாண்டங்கள் வனைவதற்கும் ஏற்றவை. அவை மிகுந்த களிப்புத்தன்மை கொண்டிருக்கும். ஏரியில் நீரில்லாத போதே ஓராண்டிற்குத் தேவையான மண்ணை தோண்டி வெளியே கொணர்ந்து குவித்துக் கொள்ள வேண்டும்.

பயன்படுத்து முன்னர் மண் நன்றாகக் காய்ந்திருக்க வேண்டும். ஒரு நாளுக்குத் தேவையான மண்ணை ஒதுக்கி முதல்நாள் இரவு தண்ணீர் தெளித்து வைத்தால், அடுத்த நாள்

பிணைவதற்கு வசதியாக இருக்கும். ஊறிய மண்ணைப் பிசைகின்ற போது, உரிய அளவு சலித்த மணல் சேர்த்துக் கொள்வர். கையால் பிணைவதோடு காலாலும் மிதிப்பர், குயவர் மண்ணைக் காலால் மிதிப்பதை நாட்டிய சாஸ்திரத்தில் அஞ்சிதம் என்பர்.

நன்கு மிதித்துப் பிணைந்த மண்ணோடு களம் கலந்து கொள்வர். கம்புக் கொம்மை அல்லது உமி ஆகியவற்றையும் கலந்து கொள்ளலாம். பொம்மை செய்யும் மண் சற்று கனமான பரலையாகப் பொம்மையில் பயன்படும் குளையில் வேகும்போது களம் அல்லது கொம்மை இருந்த இடம் எரிந்து, அந்த இடத்தில் குடான காற்று புகுந்து, நல்ல முறையில் சுடப்படும். கொம்மை மண், அல்லது கூளமண்ணை மிதித்து ஒருநாள் ஈரத்தோடு மூடி வைப்பர். இதனை மண் புழுங்குதல் என்பர்.

பெரிய பொம்மைகள் சிறுசிறு துண்டுகளாகச் செய்யப்படும். சுட்ட பின்னர் அவற்றை ஒன்றி வைத்து ஒன்றாகச் சேர்த்து கொள்வர். பெரிய குதிரைகள் செய்யும்போது கழுத்து வரை தனியாகவும், தலை தனியாகவும் செய்து ஒட்டிக் கொள்வர். இணைப்புப் பகுதியில் உள்ள ஒட்டைகளில் வழியே கயிறு மூலம் கோர்த்துக்கட்டி, சிமிட்டி கொண்டு பூசிவிடுவர். பின்னர் அதன் மீது வண்ணம் பூசிவிட்டால் இணைப்புத் தெரியாது.

சடுவதற்குப் பயன்படும் பொருட்கள் விறகு, சுள்ளி, சருகு முதலியன. இவை காசில்லாமல் கிடைத் காலம் போய் விட்டது. அனைத்தும் விலை கொடுத்து வாங்க வேண்டியுள்ளது. அதனால் சுடுமண் பொம்மைகளின் அடக்க விலை கூடிவிடுகிறது. சுண்ணாம்புக்காரை அல்லது சிமிட்டிக் காரையில் செய்யும் செலவுக்கு நெருக்கமாக வந்துவிடுகிறது. சுடுமண் பொம்மை செய்யும் கலைஞர்கள், சுதை வேலையிலும் ஈடுபட்டுள்ளனர். மண்ணில் செய்து அல்லலுறுவதைவிட, சுதையே மேல் என்றாகிவிடுகிறது.

மன்குதிர் தானியம் சேமிக்கப்பயன்படுவது, பொம்மை செய்யும் மண்ணாலேயே இதனையும் செய்வர். குதிர்களை குளையில் வைத்துச் சுட வேண்டியதில்லை. அவ்வப்போது சாணநீரால் வழித்தக் கொண்டால் போதும், குதிர் பீப்பாய் வடிவில் இருக்கும். அதன் வடிவமே அதற்கு வலிமை தருகிறது. தானியத்தைத் தனியார் சேமித்து வைக்கும் வாய்ப்பு அருகி வருவதால் இப்போது குதிர் யாரும் வாங்குவதில்லை.

சுடுமண் பொம்மைகள் செய்வோரை மண்மான் என்கிறார் திருவள்ளுவர். மண்ணீட்டாளர் என்பார் இளங்கோவடிகள். கரிகால் பெருவளத்தானைப் பாடிப் பரிசு பெற்றவர் வெண்ணிக்குயத்தியார், கோலூர்க்கிழார் போன்ற சங்ககாலப் புலவர்கள் 'கலம் செய்கோவே' கலம் செய்கோவே' என விழிப்பார்கள்.

ஈழப்பேழை என்பது இறந்தவர்களின் உடலை வைத்து

மூடி ஈமக்காட்டில் மேல்பரப்பில் வைக்கும் பேழையாகும். ஆடு, மாடு போன்ற ஏதேனும் வில்கின் வடிவில் இருக்கும் இடுப்பு இரண்டு பகுதியாகச் செய்யப்பட்டு, கீழ்ப்பகுதியில் வைத்து மேல் பகுதியால் மூடிவிடுவர். உடல்பாரம் தாங்கும் வகையில் 8 அல்லது 10 கால்கள் இருக்கும். ஆங்கிலத்தில் (SARCHOPHAGUS) என்பர்.

தன் காதலனோடு உடன்போகிறாள் தலைவி. பாலை நிலத்தில் செல்லும் போது ஆடவன் இறந்து விடுகிறான். அவனோடு தன்னையும் சேர்த்து இடும்வகையில் 'அகலிதாக வனைமோ கலம் செய் கோவே' எனக் குயவனாரை வேண்டுகிறாள்.

சோழன் நலங்கிள்ளி இறந்ததும் அவனுக்காக ஈழத்தாழி வனையும் குயவனாரையும் பார்த்து 'அளியை நீயே, கலம் செய்கோவே' என்கிறார் கோலூர்க்கிழார். பூமியையே திருவையாகக் கொண்டு, மகாமேரு மலையை மண்திரையாகக் கொண்டு வனையப்படும் பெரிய தாழியைவிட கிள்ளியின் புகழ் பெரிது என்று இரங்குகிறார் கோலூர்க்கிழார்.

அக்காலத்தில் குயவர் குடிச் சிறுவர்கள் மிகவும் புத்திசாலிகளாக இருந்தனர் எனச் சான்றிளிக்கிறார் புலவர் கோலூர்க்கிழார். 'நன்மதி வேட்கோட் தேர்க்கால் வைத்த குருஉத்திரன் மண் போலக் கொண்ட குடுமித்து இத்தண்பனை நாடே என்பார். திருவையில் உள்ள மண் குயக்கடிச் சிறுவன் கைப்பட்டு, அவன் மனம் போல வடிவம் பெறுவது போல இந்நாடே சோழனின் பேச்சின்படி நடக்கிறதாம்.

சுடுமண் கலையின் புதிய பரிமாணம், செராமிக் எனப்படும் பீங்கானாக மலர்ந்துள்ளது. கயலின் எனப்படும் வெள்ளைக் களிமண் இதன் மூலப் பொருளாகிவிடுகிறது. தொழிற் துறையில், அலம்பு தொட்டிகள், கழிவறைத் தட்டுகள், தரை ஓடுகள், சுவர் ஓடுகள் அனைத்தும் பெருவளர்ச்சி பெற்றுள்ளன. அதன் பின்னொட்டாக கலை வடிவங்கள் உருவாகின்றன. கைத்தொழில் நிலையிலிருந்து உயர்ந்து பெருந்தொழில் நிலையை அடைந்தபோதிலும், பொம்மைகள் உருவாவதில் பழைய சுடுமண் கலையும், கலைஞர்களும் முழுக்கப் பயன்படுகின்றனர் எனில் மிகையன்று.

காலதேவனின் வேகம், சுடுமண் கலைக்கு ஒரு பொருட்டல்ல. தமிழ்நாட்டுக் கல்வெட்டுகளில் அடிக்கடி வருகிற வாசகம் ஒன்றுண்டு. 'கல்லும் காவேரியும் புல்லும் பூண்டும் உள்ளவரை' என்பார்கள். இவை அழியாதவை. களிமண்ணும் அழியப் போவதில்லை.

களிமண் இருக்கும் வரையும், மனிதனுக்குக் கலையுள்ளம் குன்றாத வரையும் சுடுமண் பொம்மைகள் தன் அழகாலும், பயனாலும் தன் இடத்தை நழுவிடாது என நிச்சயமாக நம்பலாம்.

குயத்தொழிலில் பெண்கள்

திருமதி.ச.பிரகதம்,

இயக்குநர்

டாக்டர் கொடுமுடியார் ஆய்வுக் கழகம்
சென்னை.

பண்டைய மரபுத் தொழில்கள் பெரும்பாலும் குடும்பத் தொழில் ஆகும். குடும்பத் தலைவன், தலைவி, சிறுவர்கள், முதியோர் அனைவருக்கும் வேலை இருக்கும். குயத் தொழிலும் விதிவிலக்கல்ல.

சென்ற நூற்றாண்டின் திருமண நிலை இதனை எளிதில் உணர்த்தும். பெண்களுக்கு 12,13 வயதுகளிலேயே திருமணம் ஆகிவிடும். அதன் மூலம் தொழிலுக்கு ஓர் ஆள் கிடைக்கின்றார். அதனால் நிறையப் பரியம் (Bride's Price) கொடுக்க வேண்டிய நிலை இருந்தது. குடும்பத் தலைவியாக வீட்டைப் பராமரிப்பது, சமையல் வேலை, தொழிலில் உதவி, சந்தையில் விற்பனை செய்யும் வேலை அனைத்தும் அவளிடம் வந்து சேருகிறது.

பண்டைக் காலத்தில் வெண்ணிக் குயத்தியார் என்ற பெருமாட்டி இலக்கிய வானில் மின்னுகிறார். வெண்ணி என்பது ஊர்ப் பெயர். அவரது இயற்பெயர் தெரியவில்லை. கரிகாலன், சேரனை வெண்ணியில் போர்க்களத்தில் சந்தித்து வெல்கிறார். முதுகில் புண்பட்டதால் மனம் வெதும்பி, மருந்து போட்டு உயிர் பிழைக்க விரும்பாமல், புறப்புண் நாணி, உண்ணாமல் இருந்து உயிர்விகிறான் சேரன். "உன்னை விடச் சிறந்தவன் சேரனே" என்று கரிகாலனிடமே எதிரியைப் புகழ்ந்து பாடி பரிசு பெறுகிறார் வெண்ணிக் குயத்தியார். "மானம்" இன்றும் குடிப் பெருமையாகத் திகழ்கிறது.

குயத்தொழிலில், மண் கொணர்தல், நீர் கொணர்ந்து ஊற்றுதல், மண்ணை மிதித்தல், பாண்டங்களை உலர வைத்தல், உலர்ந்ததும் எடுத்து வைத்தல், சூலைக்குத் தேவையான சறுகு கொணர்தல், உலர்ந்த பாண்டங்களுக்குக் காலி மண் பூசுதல், பணக்கம்பாசி கொண்டு மெருகேற்றுதல், சூளையில் அடுக்குவதற்கு உதவி, சுட்டபின் வண்ணம் பூசுதல், சந்தைக்கு எடுத்துச் சென்று விற்று வருதல் எனப் பலவகைகளிலும் பெண்களுக்கு வேலை நிரம்ப உள்ளது. இவை அனைத்தும் கூலி ஆள் வைத்து செய்ய இயலாதவை.

திருவையில் வைத்து வளைதல், ஓரளவு உலர்ந்த பாத்திரங்களை தட்டி வடிவம் கொடுத்தல், அரக்குதல், சூளை போடுதல் போன்ற வேலைகள் பெரும்பாலும் ஆண்களின் பணியாக உள்ளன.

தமிழ்நாட்டில் கொங்குப் பகுதியிலும், கேரளத்திலும் திருவையைக் கோல் கொண்டு ஓட்டுவதில்லை. பெண்கள் தான் ஓட்ட வேண்டும்; அதாவது சுழற்ற வேண்டும். இது மிகவும் கடுமையான வேலையாகும். நாளில் பெரும்பாலான நேரம் இப்பணி இருக்கும்.

சில பகுதிகளில் பெண்களும், திருவையில் வளையும் வேலையைச் செய்வதாகத் தெரிகிறது. அதேபோன்று அடிக்கலங்களை (பச்சைப் பாத்திரங்களை) தட்டி வடிவம் தரும் வேலையும் பெண்கள் செய்கிறார்கள்.

பொதுவாகப் பெண்களுக்கு நிறைய வேலை உள்ள தொழில் இது. அதனால் மனைவியை இழந்தோர், இத்தொழிலை விட்டுவிட நேர்ந்துள்ளது. குடும்பத்துப் பெண், தலைவி போல இருந்து செய்யும் வேலையைக் கூலிக்குப் பெண்களை வைத்து செய்ய இயலாத நிலை.

ஆண்களே குலத்தொழிலை விட்டு வேறு வேலைக்குச் செல்வதால் பெண்களுக்கு இந்த வேலையும் இல்லாமல் போய்விட்டது. பெரும்பாலான குடும்பங்களில் பிள்ளைகள் படித்து வேறு வேலைக்கு வந்ததும், பெற்றோரை மண் வேலை செய்ய அனுமதிப்பதில்லை. கிராமத்திலுள்ளோர் நகரங்களை ஓட்டி குடிபெயர்ந்து வந்துவிட்டனர். அரசு வேலை, கொத்துவேலை, வியாபாரம் என்று தொழில்கள் மாறிவிட்டன. குடும்பத்தின் முன்னேற்றம் தொழில் முன்னேற்றமாக மாறிவிட்டதால் பெண்களும் நாகரிக சமுதாய மக்களைப் போலாகிவிட்டனர்.

பெண்கள் பலர் படித்து மருத்துவர்களாகவும், பொறியாளர்களாகவும் அலுவலக வேலை பார்ப்பவர்களாகவும் மாறி விட்டனர். படிக்காத பெண்கள் சிற்றாள் வேலை, தையல் வேலை போல பல கைத்தொழில் செய்கின்றனர். வசதியுள்ளோர் குடும்பத் தலைவியாகவே உள்ளனர்.

குயத்தொழில் செய்யும் பெண்கள் நிலை இன்னும் பரிதாபமாகவே உள்ளது. காலப்போக்கில், குடும்பமே தொழில் மாறும்போதுதான் இவர்களின் நிலையும் மாறும். அரசாங்கத்தின் சமூகக் காடுகள் திட்டத்தில் ஏரிகளுள் கருவேல மரங்கள் வளர்க்கப்படுகின்றன. கீழே விழும் கருவேல முள் மண்ணில் கலந்து மண் பிசையும் கையில் குத்திவிடுகிறது. அதனால் நெய்குப்பி, திண்டிவனம், செங்கை, குயவர்கள் பலர் தொழிலை விட்டு, சென்னையை நோக்கி வந்து கூலி வேலை செய்து பிழைக்கின்றனர். அந்த வீட்டுப் பெண்கள் ஆண்களோடு சென்னை வந்து கூலி வேலை செய்து பிழைக்க வேண்டியதாகிவிட்டது. எனினும் அவர்கள் படிப்படியாக உழைப்பின் மூலம் முன்னேறி வருகிறார்கள்.

எந்தத் தொழிலையும், உதவிகளின் மூலம் உயர்த்திப் பிடிக்க இயலாது. உற்பத்திப் பொருளுக்கு அதன் பயன்படு சிறப்பின் மூலம் கிராக்கி வந்து, உற்பத்தி பெருகினால் ஒழிய முன்னேற்றமில்லை. குடும்பத் தொழில்கள் இனி வெற்றி

பெறா. தொழிற்சாலைகளில், சம்பளம் கொடுத்து, உற்பத்தி செய்யும் முறை வரும்போது பெண்களுக்கும் அவரவர் திறமைக்கேற்ற ஊதியம் கிடைக்கும். குயத்தொழிலும் குடும்பத் தொழில் நிலை மாறி, தொழிற்சாலைத் தொழிலாக மாறும் போதுதான் பெண்களுக்கு விடிவுகாலம் பிறக்கும்.

குயத் தொழிலின் தற்கால வடிவம் செராமிக் தொழிலாகும். செராமிக் தொழிற்சாலையின் எல்லா வேலைகளையும் குயவர்களுக்கே கொடுக்குமாறு கேட்பது நியாயமில்லை. அத்தொழில் முனைவோராக குயவர் குடிபெருமக்கள் யாரும் உருவாகவில்லை என்பது இன்றைய நிலை.

குயவர் குடிப் பெண்கள் அழகாக பொம்மைகள் வனைவதில் வல்லவர்கள். அவர்களுக்கெனத் தொழில் கூட்டுறவு சங்கங்கள் அமைத்துத் தரலாம்.

குயவர் குடிப் பெண்கள் பெருமைமிக்க இந்திய மாதர்குலத் திலகங்களே! அவர்களுக்கெனத் தனியாக எந்தச் சலுகையும் கோரமாட்டோம். எல்லாப் பெண்களும் முன்னேற வேண்டும். அப்போது இக்குடிப் பெண்களும் முன்னேறிவிடுவார்கள்.

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கட்டிடக் கலையில் பாரம்பரியத் தச்சத் தொழிலாளர்கள் நிலை ஒரு கண்ணோட்டம்

சி. செயல்மணி ஆச்சாரி,
சென்னை - 600 094.

கூகைகளிலும், மரநிழல்களிலும் வாழ்ந்த மனித இனம், இயற்கையின் சீற்றத்திலிருந்தும், விலங்குகளிலிருந்து தன்னைக் காத்துக் கொள்ள வீடுகள் அமைத்து வாழத் தொடங்கிய காலத்திலிருந்து மரவேலை செய்யும் தச்சர்கள் பணி இன்றியமையாதது ஆகிவிட்டது என்றால் மிகையாகாது. மண்ணால் சுவர்கள் அமைத்துக் கொண்டவனுக்கு மரங்களினாலும் ஓலைகளினாலும் கூறைகளை அமைத்துக் கொடுத்தது தச்சப் பணியே.

பரிணாம வளர்ச்சியினால் எவ்வளவோ நவீன விஞ்ஞான தொழில் நுட்பங்கள் வளர்ந்த இன்றும் வாசல்கால், கதவுகள், சாளரம் என்ற ஜன்னல் மற்றும் இண்டிரியல் டெகோரேஷன் எனப்படும் வீட்டுள் அலங்காரம் கட்டில், மேஜை, நாற்காலி, போன்றவைகளைச் செய்து கொடுத்து நமது கலாச்சாரத்தின் பாரம்பரியத் தொழில் நுட்பத்தைக் காத்து வருகிற தச்சத் தொழில் செய்து வருபவர்களைப் பற்றிய ஆய்வே இக்கட்டுரை.

தொழிலில் சிறப்பு

கிராமங்களே மிகுதியான இந்திய நாட்டில், கிராமங்களில் வசிக்கும் தச்சர்கள் நம்மைச் சுற்றியிருக்கும் இதர சமுதாய மக்களுக்கு வேண்டிய இன்றியமையாத தேவைகளைச் செய்து தருகிறார்கள்.

அதாவது, மனித இனத்தின் முதல் அடிப்படைத் தேவையான உணவு உற்பத்தி செய்யும் வேளாண் பெருமக்களுக்குத் தேவையான உழவு கருவிகள், மாட்டு வண்டிகள், போன்றவைகளைச் செய்து தருகிறார்கள்.

இரண்டாவது அடிப்படைத் தேவையான உடைகள்

நெய்து தரும் நெசவாளர்களுக்கு வேண்டிய தறிகள் அதற்கான உதிரிப் பாகங்கள் செய்து தருகிறார்கள்.

முன்றாவது தேவையான உறைவிடம் ஆகிய வீடுகள் கட்டுவதற்கான வாசல் நிலை, கதவுகள், ஜன்னல்கள் மற்றும் பர்னீச்சர்ஸ் என்று சொல்லப்படும் கட்டில், மேஜை, நாற்காலிகள் ஆகியவைகள் செய்து தருகிறார்கள்.

இவை அல்லாது கோவில்களுக்கு வேண்டிய வாகனங்கள், கதவுகள், பல்லக்குகள் ஆகிய மரத்திலானவை மற்றும் தேர் ஆகியவைகளை செய்துளிக்கின்றனர்.

இசைக் கருவிகள் ஆன வீணை, தம்புரா, வயலின், மிருதங்கம், நாதஸ்வரம் ஆகியவைகளைச் செய்பவர்கள் இவர்களே.

நகரத்தில் இடம் பெயர்ந்த தச்சத் தொழிலாளர் பலர் இன்று கட்டிட வேலைகளுக்கு மிகவும் முக்கியமானவர்களாகக் கருதப்படுகின்றனர்.

இவர்களின் இத்தொழில் நுட்பத் திறனை பின்பு தனித்தனியாக எடுத்துக் கொண்டு ஆராயலாம்.

வரலாற்றுப் பாரம்பரியம்

ஐந்தொழிலை செய்துவரும் விஸ்வகர்ம சமுதாயத்தில், மரவேலை என்னும் தச்சத் தொழில் செய்யும் மயவிஸ்வகர்மாக்கள் இதனைப் பாரம்பரியமாகச் செய்து வருகின்றனர். வேதங்களிலும், இதிகாசங்களான மகாபாரதத்திலும், இராமாயணத்திலும் இவர்களைப் பற்றிய செய்தி மிகுதியாகக் காணப்படுகின்றன. ரதகாரிகள் என்றும் சூத்திரதாரிகள் என்று இவர்களை வர்ணிக்கும் "பிரகத்சமிதா" என்ற நூலும், 'சில்ப

சாஸ்திரம்' என்ற நூலும் எவ்வாறு மரங்களை வெட்ட வேண்டும், பக்குவப்படுத்த வேண்டும் என்னென்ன மரங்களில் எவ்வகையான கருவிகள் செய்ய வேண்டும் என விவரிக்கின்றன. ஏணிகள், பாத்திரங்கள், ரதங்கள் செய்யும் இவர்களின் தொழில் நுட்பத்தைப் பேசும் ரிக்வேதம் இவர்களை துவிஷ்டி என்றும் தக்ஷன் என்றும் போற்றுகிறது. இவர்கள் படகு மற்றும் கப்பல்கள் கட்டும் திறமையைப் பற்றி ஜாடக இலக்கியங்கள் பேசுகின்றன. மத்சய புராணமும் இவைகளைப் பற்றி கூறுகின்றன. மோகன்ஜோ அகழ்வாராய்ச்சிகளின் எச்சங்கள் இவைகளுக்குச் சான்று கூறுகின்றன.

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நேற்றைய வேளாண்மை - ஒரு வாழ்க்கை நெறி

பி.கோமதி நாயகம்

விவசாய சேவாநிலையம்

புளியங்குடி

உலகில் பல ஆயிரக்கணக்கான ஆண்டுகளுக்கு மேலாக விவசாயம் செய்து வரும் நாடுகளில் இந்தியாவும் ஒன்று. அன்றை விவசாயம் மக்களுக்கு உணவு தருவதற்காகவோ, வருமானம் பெறு வேண்டியதற்காகவோ மட்டும் நடைபெறவில்லை. அது ஒரு வாழ்க்கை நெறியாக இருந்தது. பட்டங்கள் வேண்டியதற்காகவோ மட்டும் நடைபெறவில்லை. அது ஒரு வாழ்க்கை நெறியாக இருந்தது. பட்டங்கள் அதாவது பருவங்களை அடைப்படையாகக் கொண்ட பயிரிடும் முறை இருந்தது. அந்தந்தப் பருவத்தில் மட்டுமே விளையும் பயிர்கள் இருந்தன. இந்த மண்ணில் இங்குள்ள காலநிலை, மழை அளவு, சூரிய ஒளி, காற்று இவற்றின் நிலை அறிந்து சாகுபடி நுட்பங்கள் பின்பற்றப்பட்டன. ஆங்கிலத்தில் சொல்லப்படும் Photo Periodism என்பதற்கு ஏற்ப பயிர்களைத் தேர்வு செய்தனர். ஒவ்வொரு ஊருக்கும் உள்ள விசேடமான தட்ப வெப்ப நிலை, மழை அளவைப் பொறுத்துப் பயிர்கள் உருவாயின. உதாரணமாக நெல் ரகங்களில் ஆயிரக்கணக்கான ரகங்கள் இருந்தன. அது அந்தந்தப் பகுதியில் நிலவிய கால நிலையை அடிப்படையாகக் கொண்டுதான் உருவாயின. எங்கள் பகுதியில் மொழிக்கறுப்பு என்ற முரட்டு ரக - சிகப்பு நிறம் உள்ள அரிசி தரும் நெல் அதைக் கடின உழைப்பாளிகள் மட்டுமே சாப்பிடுவார்கள். அதிக உழைப்பு இல்லாத மக்களுக்கு சம்பா, ஆனைக்கொம்பன் போன்ற சன்னரக அரிசி பயிடப்பட்டன. அன்று இருந்த அதிசயமான நெல்லில் ஒருவகையை உங்களுக்கு நினைவுபடுத்த விரும்புகிறேன். குலை வாழை நெல் என்பது அதன் பெயர். குளங்களில் நீர் தேங்கி நிற்கும் பகுதியில் மட்டுமே இது வளரும். குளங்களுக்கு நீர் வருவதற்கு முன்னதாக விதைத்துவிடுவார்கள். குளம் நீரால் நிரம்பினாலும் இது வளர்ந்து நீர் மட்டத்திற்கு மேல் தலைகாட்டியபடியே நின்று கதிர்விடும். நீரின் உயரத்திற்கு ஏற்ப இது வளரும். இடுப்பளவு நீரில் நின்று கொண்டே இதன் கதிர் அறுவடை நடைபெறும். இந்த அரிசிக்கு மருத்துவ குணங்கள் பல உண்டு என்றும் கூறுவார்கள்.

இன்றைய சமுதாய நிலை

தச்சர்கள் இந்திய நாட்டின் எல்லாப் பகுதிகளிலும் வாழ்கின்றனர். எல்லாச் சமுதாய மக்களுக்கும் இவர்களது சேவை தேவையாக இருக்கிறது. இவர்களில் பெரும்பாலானோர் நிரந்தரமான தொழில் இன்றி வறுமை கோட்டிற்கு கீழேதான் வாழ்கின்றனர். இவர்களுக்கு என நிரந்தர வருமானமோ, அரசாங்கங்களின் ஆதரவோ போதுமானதாக இல்லாமையால் வாழ்வில் முன்னேற வழியில்லாமல் இருக்கின்றனர். இதற்குத் தக்க வழிகள் காணாதல் மிகவும் அவசியம் ஆகிறது.

உழவர் உலகத்தார்க்கு ஆணி

அன்றைய விவசாயத்தின் அடிப்படையாக இருந்தது கால்நடைகள்தான். காளைகளும், பால்தரும் பசுக்களும் இல்லாத விவசாயிகள் இருந்ததில்லை. பால், மோர் முதலியன பணத்திற்காக விற்பனை செய்யப்படுவது இல்லை. பண்ணையில் வேலை செய்யும் கூலியாட்களுக்கு இவைகள் தாராளமாக தரப்பட்டன. விவசாயி, தொழிலாளி உறவு அநேகமாக எல்லா இடங்களிலும் மகிழ்ச்சியாகவும் பாச உணர்வுடனும் இருந்தன. பண்ணைத் தொழிலாளிகளுக்கு தினமும் நில உடமையாளர்களின் வீட்டில் சாப்பாடு உண்டு. தீபாவளி போன்ற பண்டிகை நாட்களில் துணிகள் வழங்குவார்கள். இப்போதுள்ள மனநிலைக்கு முற்றிலும் மாறான ஒரு கடமை உணர்வுடன் தொழிலாளிகள் உழைத்தார்கள். விவசாய நிலயம் உடையவர்கள் சமூகத்தில் நல்ல அந்தஸ்துடன் வாழ்ந்தனர். "விருந்திருக்க உண்ணாதான் வேளாண்" என்ற பழமொழியின் மூலம் அன்றைய நிலையை ஓரளவு தெரிந்து கொள்ளலாம். கிராமங்களில் உணவு விடுதிகள், காப்பிபார்கள் இருந்ததில்லை. யார் வீட்டிலும் எந்த நேரம் போனாலும் ஏதாவது உணவு கிடைக்கும் என்ற நிலை இருந்தது.

இயற்கையாக ஒன்றியை விவசாயம்

மண் வளத்தை சீர்குலைக்காது அதை மேலும் மேலும் வளப்படுத்தும் முறையில் தான் விவசாயம் இருந்தது. அந்தந்தப் பட்டத்தில் சாகுபடி வேலைகள் நடந்தன. "பட்டம் தப்பினால் நடட்டம்" என்ற பழமொழி இதனாலேயே உருவானது. விவசாயத்தின் மேன்மையைப் பற்றி ஏராளமான பாடல்களும் பழமொழிகளும் உருவானது. முழுக்க முழுக்க இயற்கை உரம் மட்டுமே பயன்படுத்தப்பட்டதால் விளைபொருள்கள் நல்ல தரத்துடனும், சத்துக்களுடனும் ருசியுடனும் இருந்தது. மக்கள் கடின உழைப்பாளிகளாக திகழ்ந்தனர். பருவ கலாத்திற்கு ஏற்ப உணவு முறைகளிலும் மாற்றம் இருந்தது.

தது. உழைப்பாளர்கள் கடும் வெயில் காலத்தில் கம்பு, தினை, ராகி போன்ற சிறு தானியங்களை காய்ச்சி மோரின் ஊற வைத்துக் குடித்துவிட்டு வேலைக்கு வந்தனர். இதனால் உடலில் படும் வெயின் கூட சடுவதில்லை. உடல் நிலை சீர் கெட்டாலும் இயற்கை வைத்திய முறைகள் மூலம்தான் சிகிச்சைகள் நடந்தன. சமூக வாழ்க்கையில் தீண்டாமை போன்றவை தீவிரமாக இருந்த காலத்திலும் மனித நேயம், உபகாரம் செய்யும் மனப்பான்மைகள் அதிகமாகவே இரந்தன. அன்றைய விவசாயம் இருதரப்பினரை அடிப்படையாகக் கொண்டிருந்தது. நில உடமையாளர்கள் ஓரதரப்பு. அவருக்கு வாரம் அல்லது குத்தகை தரும் விவசாயத் தொழிலாளி மற்றொரு தரப்பு. இவர்களுக்கிடையே நல்ல உறவு ஒற்றுமையும் இருந்தது. நீண்ட காலமாக சாகுபடி செய்து வந்த பலருக்கு மான்யமாகவே நிலச் சொந்தக்காரர்கள் நிலம் தந்த நிகழ்ச்சிகள் உண்டு. குத்தகை அல்லது வாரம் சம்பந்தமான தகராறுகள் இருந்தது இல்லை. சுருக்கமாகச் சொன்னால் அன்றைய விவசாயம் வருமானத்தை முன்னிறுத்தி செய்யப்பட்டது அல்லது. மனநிறைவுடன் வாழ்ந்தனர். மண்வளம் பேணப்பட்டது. இரசாயன உரமோ, பூச்சிக் கொல்லிகளோ பழக்கத்தில் இல்லை. கால்நடைகள் நிறைந்திருந்தன. மாடு என்பதன் பொருள் செல்வம் என்பதாகும். வாழ்க்கைத் தேவைகள் குறைந்த காலம். எனவே திருப்தியாக மக்கள் வாழ்ந்தனர். இன்னொரு குறிப்பிடத்தக்க விஷயம் என்னவென்றால் பெரும்பாலான ஆண்டுகளில் மழை உரிய காலங்களில் தவறாது பெய்யும்.

இன்று

பசுமைப்புரட்சி என்ற மாயவலை

இன்றைய வேளாண்மை என்பது பசுமைப் புரட்சிகளுக்குப் பின் நடைபெறும் விவசாயத்தைக் குறிக்கும். இன்றைய விவசாயம் வருமானத்தைப் பெருக்க வேண்டும். பெருகி வரும் வாழ்க்கைத் தேவைகளை பூர்த்தி செய்ய நிலத்தில் உற்பத்தியைப் பெருக வேண்டும். அதற்காக புதிய ரக வீரிய ரகங்கள், ரசாயன உரங்கள், பூச்சிக் கொல்லிகள் என்று துவங்கிவிட்டது. பசுமைப் புரட்சியின் ஆரம்ப காலத்தில் அதிக உற்பத்தி கிடைத்தது. இதனால் ஏதோ மாயா ஜாலம் நடந்தது போல் விவசாயிகள் மத்தியில் பெருந்த உற்சாகமான வரவேற்பு கிடைத்தது. சில ஆண்டுகளில் விவசாய விளைபொருள்களின் உற்பத்தி பல மடங்கு பெருகி நாட்டின் தானியக் களஞ்சியங்கள் நிரம்பி வழிந்தன. விவசாயிகள் வேக வேகமாக இந்த மாற்றத்திற்கு தங்களை உட்படுத்திக் கொண்டனர். பாரம்பரியமாக, ஆயிரக்கணக்கான ஆண்டுகளாக வழக்கில் இருந்த சிறந்த ரகங்கள் மறைந்து குட்டை ரகப் பயிர்கள் நிலத்தை ஆக்கிரமித்தன. விளைவு பல மடங்கு பெருகிறது. விவசாயிகள் மத்தியில் பேராசை தலை காட்டிய நிலை உருவானது. அரசின் விவசாயத்துறை மற்றும் வேளாண் விஞ்ஞானிகளின் இந்தச் சாதனை பற்றி வெகுவாப் புகழ்ந்த பேசப்பட்டன. இவை எல்லாமே சுமார் 20 ஆண்டுகள்தான் நீடித்தன. அடுத்த கட்டம் பிரச்சினைகள் உருவான கட்டம் என்று சொல்லலாம். நில வளம் குறைந்தது. நமது மூதாதையர்கள் ஆயிரக்கணக்கான ஆண்டுகளாக சேமித்து வைத்த மண்வளம் இரசாயன உரம், நச்சு மருந்துகள்

ளால் சிதைந்து விட்டன. மண் என்பது ஒரு தொழிற்சாலை போன்றது. அதில் ஏராளமான மண் புழுக்களும் நுண் உயிர்களும் வாழ்ந்து பல்கிப் பெருகி பயிர்களை வளர்த்தன. அதற்கு இயற்கை உரங்களே உணவு ரசாயன உரமும் பூச்சிக் கொல்லிகளும் மண் புழுக்களையும் நுண்ணுயிர்களையும் அடியோடு அழித்துவிட்டன. மண்ணின் இயக்கம் இதனால் ஸ்தம்பித்தது. மண் மலட்டு மண் ஆனது. புதுய ரகங்களுக்கு அதிகமான தண்ணீர் இக்கரணத்தினால் தான் தேவைப்பட்டது. அத்தடுன் குட்டைரக நெல்லி இலைகள் அகலமானவை. அதில்ல சிலிகான் போன்றவை இல்லை. எனவே இலைச்சுருட்டுப் புழுக்கள் போன்றவை சாதாரண நாட்டுரக நெல்லில் தோன்றுவதை விட பலமடங்கு தோன்ற.

பூச்சிக் கொல்லிகளின் விபரீதம்

பூச்சிக் கொல்லிகள் கடும் விஷத்தன்மை உடையவை. ஆனாலும் அவைகள் பூச்சிகளை அழிக்க இயலவில்லை. ஏராளமான பூச்சிகள் இத்தகைய விஷயத்தை தாங்கி நின்று தனது அமைப்பையே மாற்றி வாழத் தொடங்கின. இவைகளின் இயற்கை எதிரிகள்தான் அழிந்தன. இதனால் தான் முதலில் பூச்சிகளை அழிக்க பூச்சிக் கொல்லிகளைத் தெளிக்கச் சொன்ன விஞ்ஞானிகள் இப்போது அதை மாற்றி ஒருங்கிணைந்த பூச்சிக் கட்டுப்பாடு என்ற புதிய கோஷத்தை வைக்கின்றனர். அத்துடன் பல்வேறு குறிப்பிட்ட சில பயிர்களை முற்றிலும் கைவிடும் நிலைக்கு விவசாயி வந்துவிட்டார். இன்று கோவையில் பருத்திப் பயிர் வெள்ளை ஈ தாக்குதலுக்கு ஈடு கொடுக்க இயலாத நிலையில் கை விடப்பட்டது. வ.உ.சி. மாவட்டத்தில் கொல்லங்கிணறு, ஒட்டநத்தம் போன்ற பகுதியில் மிக நல்ல தரமுடைய பருத்தி பல ஆயிரக்கணக்கான ஆண்டுகளாக சாகுபடி செய்யப்பட்டு இங்கிலாந்துக்கு ஏற்றுமதி செய்யப்பட்டது. இந்த பருத்தி தூத்துக்குடி வழியாக வெளிநாடு சென்றது. இப்போது தூத்துக்குடியில் இந்தப் பருத்தி கொண்டு செல்லும் சாலைக்கு Great Cotton Road என்று தான் பெயர். ஆனால் இன்று அப்பகுதியில் பருத்தி சாகுபடி கைவிடப்பட்டதால் பருத்தி வரவு இல்லை. எனவே இயற்கையை எதிர்த்து விஞ்ஞானிகள் செயல்பட்டதில் தோல்விகண்டது உண்மை. இயற்கை உரங்களை அலட்சியப்படுத்தி செயற்கை உரங்களை பயன்படுத்தி, பூச்சிக் கொல்லிகளைப் பயன்படுத்தி செய்த விவசாயம் இன்று தோல்வியடைந்துவிட்டது. யூனியா போன்றவற்றை உரம் என்று கூறுவது அடிப்படை யில் தவறு என்பது எனது கருத்து. உரம் என்பது பயிரை அல்லது மண்ணை வளப்படுத்துவதாகும். ஆனால் யூனியா போன்றவை மண் வளத்தைச் சுரண்டுவது அல்லது உறுஞ்சுவது. எனவே இது உரம் அல்ல. உறிஞ்சி என்றுதான் கூற வேண்டும். அத்துடன் பூச்சி மருந்து என்று கூறப்படுபவைகள் எல்லாமே அடிப்படையில் விஷங்கள் தான். அவைகள் மருத்துவக்குணம் கொண்டவை அல்ல. இதை விவசாயிகள் கவனத்தில் கொள்ள வேண்டும்.

விவசாயிகளின் சுமைகள்

விஞ்ஞானிகளின் பலவிதமான சோதனைக்கு உட்படுத்த

தப்பட்டதான் இன்று பாதிக்கப்பட்டது விவசாயிதான். இதனால் ஏற்பட்ட கடன் சுமை இன்று பெரும் பிரச்சினையாக உள்ளது. இந்த நேரத்தில் விவசாயிகள் கடன் பிரச்சினை பற்றி சில விஷயங்கள் கூறுவது அவசியம். விளைபொருட்களுக்கு அரசு கட்டுபடியான விலை நிர்ணயம் செய்வது இல்லை. ஆனால் இடு பொருட்களின் விலை இன்று இதர வாழ்க்கைக் கான செலவுகள் ஆண்டுதோறும் உயர்ந்து கொண்டே வருகிறது. பற்றாக்குறை ஏற்படும் காலங்களில் அரசு கட்டாயக் கொள்முதல், கையிருப்புக்கு வரம்பு கட்டுதல், ஓரிடத்தில் இருந்து இன்னொரு இடத்திற்கு தான்யங்களைக் கொண்டு செல்ல தடை செய்தல் போன்றவைகளும் மூலம் விலையைக் கட்டுப்படுத்துகிறது. ஆனால் அதேபோல் உற்பத்தி பெருகி விலை வீழ்ச்சி ஏற்படும் போது அரசு கண்டு கொள்வது இல்லை. அத்துடன் கடன்மீது விதிக்கப்படும் வட்டி இன்று விவசாயிகளுக்கு சுமையாக மாறிவிட்டது. கடன் வாங்கிச் செய்யும் விவசாயி தனது நிலத்தில் பெறும் லாபத்தின் மூலம் வட்டியை மட்டுமே கட்ட முடியும் என்பதுதான் உமை. அத்துடன் அதிக உடல் உழைப்பு தேவைப்படும் தொழிலில் ஈடுபடும் கூலியாட்களுக்கு கிடைக்கும் ஊதியம், பிற உடல் உழைப்பு அதிகம் தேவைப்படாத தொழிலில் கிடைக்கும் ஊதியத்தை விட மிகக் குறைவு. அத்துடன் சத்தும், ருசியும் இல்லாத விளைபொருள்களைக் கூலியாட்கள் சாப்பிடுவதால் உழைக்கும் திறனும் குறைவு. வெயிலில் பாடுபடும் தொழிலாளிகள் அன்று போல் சிறு தான்யங்களை சாப்பிடுவது இல்லை. நகர வாழ்க்கையில் மோகம், வருமானம் குறைந்த விவசாயிகளைக் கவர்ந்து இழுக்கின்றது. கடந்த 35 ஆண்டுகளாக மழை அளவும் சீராக இல்லை. மண் வளம் குறைந்து வருகிறது. கட்டுபடியாகும் விலை இல்லை. உரிய நேரத்தில் ஆட்கள் கிடைப்பது இல்லை. கடன் சுமை என்று பல்வேறு காரணங்களால் இன்று விவசாயி மலட்டு மண்ணுடன் போராடுகிறான். படித்த இளைஞர்கள் இன்று விவசாயத்தை ஒரு தொழிலாக நினைத்து இதில் ஈடுபட முன்வருவது இல்லை. ஆக இன்று விவசாயம் பிரச்சனைகள் மிகுந்த ஒரு தொழிலாக மாறி நிற்கிறது. இதற்கு மாற்று என்ன? சிந்தியுங்கள்.

நாளைய

கால்நடைகள் விவசாயத்தின் முதுகெலும்பு

நாளைய விவசாயம் எப்படி அமையப்போகிறது என்பதை தெளிவாக கூறும் நிலையில் நான் இல்லை. ஹாலந்து, இஸ்ரேல் போன்ற நாடுகளில் கீரீன்ஹவுஸ் (Green House) மூலம் மிகக் குறைவான மனிதர்களைக் கொண்டு கம்யூட்டர் உதவியுடன் விவசாயம் நடந்து வருகிறது. நமது நாட்டின் நிலை வேறு. இங்கு ஏராளமான இயற்கை வளங்கள், பல்வேறு மண்வகைகள், காலநிலைகள் உள்ளன. மக்கள் தொகையும் ஏராளம். எனவே நமது சிந்தனையின் வேர் மேலை நாட்டின் நிலையில் அமையக் கூடாது. கால்நடைகள்தான் வேளாண்மைக்கு ஆதாரம். ஒரு சிறிய கணக்கை உங்கள் முன் வைக்கிறேன். ஒரு பசு மாடு தினமும் சராசரியாக 10 கிலோ

சாணம் தருகிறது. 10 தினங்களில் 100 கிலோ. இத்துடன் 1500 கிலோ வேளாண் கழிவுகள் 1800 கி. வண்டல் 2000 லிட்டர் தண்ணீர் இதை 12'நீ 5' அ x 3' ஆழம் உள்ள குழியில் போட்டு கம்போஸ்ட் தயாரித்தால் மூன்று அல்லது 4 மாதங்களில் 3 டன் சத்துள்ள உரம் கிடைக்கும். அதாவது ஒவ்வொரு 10 தினங்களுக்கும் ஒரு முறை இக்கம்போஸ்ட் தயாரிக்க இயலும். இதில் 800 கி தழைச்சு சத்தும் 560 கி பாஸ்பரஸ் 1050 கி சாம்பல் சத்தும் மற்றும் 70 கி நுண் சத்துக்கள் உள்ளதாகக் கூறுகின்றனர். இன்றைய ரசாயன உரவிலைப்படி மேலே குறிப்பிட்ட சத்துக்கள் பெற குறைந்தது 200 ரூ தேவை. ஒரு ஆண்டில் ஒரு பசு மூலம் சுமாராக 80 டன் பெறலாம். அதாவது பால் அல்லாமல் சாணத்தில் மூலம் மட்டுமே ஒரு பசு மூலம் கிடைக்கும் உரம் மட்டும் ஆண்டு 16,000 ரூபாய். அப்படியானால் ஆண்டுதோறும் 16,000 தரும் உரத் தொழிற்சாலையாகத்தானே பசுவை நாம் பார்க்க வேண்டும். இதை நன்கு சிந்திக்க வேண்டும். மற்றும் ஒரு கணக்கு. சுமார் 4 கோடி கலப்பைகள் செய்யும் உழவு வேலை டிராக்டர் மூலம் செய்வதாயின் 30 லட்சம் டிராக்டர் தேவை என்கின்றனர். இதற்கு எத்தனை கோடி தேவை, மற்றும் இந்த இயந்திரங்கள் இயங்க தேவையான டீசல் மற்றும் ப்ராமரிப்புச் செலவுகளைக் கணக்கிட்டால்தான் எருதுகளின் மேன்மை புரியும். 1 1/2 கோடி மாட்டு வண்டிகள் செய்யக்கூடிய போக்குவரத்து வேலைகளைச் செய்ய 8 லட்சம் லாரிகள் தேவை. இவற்றின் கிரைய மதிப்பு குறைந்தது எத்தனை ஆயிரம் கோடி என்று பாருங்கள். அத்துடன் சாணத்தின் மூலம் எரிவாயு பெறலாம். சுமார் 18 கோடி கால்நடைகள் மூலம் கிடைக்கும் எரிவாயு மூலம் சுமார் 36 கோடி மக்களுக்கு உணவு தயாரிக்கலாம். விறகு பயன்படுத்துவதால் எத்தனை ஏக்கர் காடுகள் அழியும் என்பதைக் கணக்குப் பாருங்கள். எனவே நாளைய விவசாயம் கால்நடைகளை ஆதாரமாகக் கொண்டு அமையவேண்டும். இதன் மூலம் இப்போதுள்ள உற்பத்தியைவிட பல மடங்கு பெருக்க முடியும். மக்களின் ஆரோக்கியம் பாதுகாக்கப்படும். இன்னும் 100 கோடி மக்களும் கூட வாழ இயலும். நீர் நிர்வாகம் போன்றவற்றிற்கு சொட்டு நீர் பாசனம் போன்றவைகளைப் பயன்படுத்தலாம். விவசாயிகள் நினைத்தால் உயர்ந்துவரும் விலைவாசிகளைக் கட்டுப்படுத்திக் குறைக்க முடியாது. ஆனால் முயற்சி செய்து, சிந்தித்து செயல்பட்டால் ஒரு விவசாயி தனது உற்பத்திச் செலவை இயற்கை விவசாயம் மூலம் கணிசமாகக் குறைத்து லாபம் ஈட்ட முடியும். படித்தவர்களுக்கு எல்லாம் வேலை தர இயலாது. பாமரமக்களின் தொழில் விவசாயம் என்ற நிலைமாறி, இதுவும் தொழில் நுட்பங்கள் கொண்ட லாபம் தரும் தொழில் தான் என்ற நிலையை உருவாக்கிட படித்த இளைஞர்கள் விவசாயிகளாக மாறுவார்கள். நாளைய விவசாயம் என்பத கால்நடைகளை அடிப்படையாகக் கொண்ட, படித்த இளைஞர்களின் பங்கேற்கும், திருப்தியாக, பேராசையற்ற முறையில் உள்ள அமையும். அமைய வேண்டும் என்பது எனது கருத்து மற்றவை உங்கள் சிந்தனைக்கு விட்டுவிடுகிறேன்.

Chapter 19

Some Additions

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Late-1 **Some thoughts on JFM for Consideration Presented by a NGO
Working among Tribals in the Eastern Ghats**

*Sivaramakrishna
c/o SAKTI*

Livelihood of tribals is inextricably linked to forests in one or the other way. But do we recognise that tribals all over the world have strong conventions of managing local resources, especially their forests? Just as we need proper soil and water construct to plan species suitable to a area, we need to understand how JFM must be for the tribals. In the eastern ghats, tribals have a tradition of sharing game/usfruct equitably from forests. They are pioneers of JFM with insights of how community bonds, grow and survive. Conventions on forests management continue among the tribals even though institutions and environment is under increasing threat.

In such a scenario we introduced the concept of private ownership of land, alien to resource sharing through land pattas in the name of individuals especially men. Panchayati Raj is another political institution on tribals who are practicers of sharing, equality and principles of community development. Panchayats are demanding a levy/share in resources from community lands and usfruct. We want *forest management* through JFM. A complex bureaucratic/management structure is incorporated in the formation and governance of VSS, forest development and usfruct sharing. The management of local resources, livelihood and community access is complicated and politicised for the tribal. History notes several such processes by which the tribals are denied traditional rights, impoverished and subjugated.

The AP forest dept. has been a source of finance to the govt. it collects revenues exceeding seventy crores of rupees but invests fifteen crores in forest development. A quick GIS will show that most of the incomes come from areas inhabited by tribals. Now the World Bank has stepped in. Some policy changes have been made and more may come. At best the Bank seems interested in aspects of good public relations portfolios-no displacement of persons from wild life sanctuaries, people's participation, market prices for forest produce, better technology, MIS etc. The NGOs are partners in protecting forests, sharing information and promoting JFM.

Why don't we think of simplifying JFM rather than scaring away the tribals? If so, the first step is to accept the existing resource sharing arrangements among tribals and recognise them as VSS. The next is to document, understand and strengthen such mechanisms to provide simpler VSS systems. Our objective should be to strengthen the basis for healthy community relationship. Thirdly, don't push VSS as the only way to manage livelihoods and forest resources. Fourthly, let the tribals know when the forest dept is planning to cut the trees so that they can understand, co-operate and monitor protection of their forests better. Finally, make the tribal share the repayment of the loan and use the money as sparingly as they have while borrowing from money lenders wanting tied sale of honey and tamarind.

Late-2 **The Tribal Communities and their Indigenous Techniques**

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Several indigenous technologies are being used by the different tribal communities around the world. They have got indigenous techniques for hunting wild animals, constructing dual houses, cultivation of crops, crop protection, harvest, irrigation, grain storage houses, and curing various human and plant diseases. These indigenous technologies are passed by one generation to next. Besides their survival, these indigenous technologies also help them to sustain their life without creating much harm to the environment.

The indigenous technologies are developed for their adaptation to specific environmental, geographical and cultural needs. So we come across lot of variation among the indigenous technologies adapted by different cultures. For instance, the boomerangs are used by only Australian aboriginals, while the harpoons are found only among the *Eskimos*. The Onge of Andaman islands carve out the canoe through their traditional way. The *Kung-bushmen*-hunter gatherers of Kalahari desert

are surviving with the help of bow and arrow in the past for thousands of years. The *Mbuti pygmies* of Ituri forest in Congo are killing huge elephants with the help of their small poisonous arches. The *Hopi* Indians of South West U.S.A., traditionally employed irrigation in their farming.

The fiercest tribes, the *Yanomami*, *Siriono*, *Suya*, and *Wayaha* are used to poison water to suffocate fish. These primitive groups are surviving in the tropical rain forests of Brazil. The *Irulas* of Chengalpattu district of Tamil Nadu have the traditional skills of snake catching and knowledge of the medicinal plants. These kinds of hundreds of examples about indigenous cultures of the world have to be understood, for knowing about the survival of these patterns.

Anthropological survey of India have surveyed about 462 cultures as far as India is concerned. There are 36 indigenous cultures/scheduled tribes found in Tamil Nadu itself. Malayalis are found to be the largest hill tribe found in Tamil Nadu in

numerical strength. They are found in hilly tracts of Kalvirayan hills (in South Arcot Dt.), Javadhi hills (in North Arcot Dt.), Kolli hills (in Salem Dist.), Chittari hills (in Dharampuri Dt.) and Pachamalai hills (in Tiruchirapalli Dist.)

In this paper, an attempt is made to trace some of the traditional practices of Malayalis of Panchamalai hills such as agriculture, medicine, preserving grains, irrigation, and nature conservation.

Late-3 Customary Rights in Sustainable use of Pastures Changpas of Ladakh

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Ladakh lies between north latitude 32°45' to 35°50' and east longitude 75°45' and 80°30'. The Changpas are nomadic tribes who inhabit the Rupshu with an approximate area of 5,500 sq. km. The lowest level of the valley in this region is 13,500 ft. above sea level, while the mountain that surround it have a range in height from 20,000-22,000 ft. Vegetation is extremely scanty, the only herbage for the flocks being found by the streams and a little on the hill sides.

Tibetans settled in Ladakh around A.D. 500-600. From A.D. 930 Ladakh came under the direct rule of Tibetan Kings. It was also the time that Tibetan feudal chieftains built their citadels. Rupshu was under such chieftains, who were all powerful till the 17th century. Part of Rupshu adjoining the Tibetan Plateau is called the Changthang, hence the name Changpas. The history of Changthang indicates that it was once ruled by the powerful feudal lords who were called the Rupshu *goba*. The gobas had organized the nomadic groups and their resource use well. The goba had a list of pastures and the names of households who had access to those pastures. After these gobas lost

their power in the 17th century, the smaller villages organized themselves and elected headmen who now came to be called goba. Each goba acquired similar lists of pastures and households for the area under his control, and organized their customary rights. The procedure is documented in the paper.

The use of pastures according to their traditional customs has ensured certain amount of equity in access. This system is coming under certain strain because the population is expanding and the Tibetan refugee influx is adding to the burden on the resources in a fragile area. The polyandrous system ensured that the number of households did not increase, by their own admission the younger generation no longer favour this system. The culling of excess animals before they shift to the winter pastures was another strategy which helped prudent resource use, but presently the increasing number of households have led to an increase in the number of livestock. The traditional sustainable community is facing many survival dilemmas which requires some interventions.

Late-4 Folk/Community Traditions in Weaving

Vijaya Ramaswamy

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The song of the loom was born as the weaver moved the shuttle to and fro. A verse from the Atharva Veda in a picturesque reference to the vertical loom says:

A man weaves it, ties it up; a man hath borne it upon the firmament. These pegs propped up the sky; the chants they made shuttles for weaving...

The chant here refers to the rhythmic sound made by the shuttle as it lifts the woof of vertical threads and passes through the weaving shed. It is this inbuilt rhythm which made it easier for the weavers to weave to the music of the loom. Thus were born the earliest folk traditions of the weavers. As one hears the weavers of Uraiyur or Erode sing of their glorious heritage and mythological origins one is reminded of the weaver-saint of Benaras, Kabir, who wove his entire philosophy of life into the cloth on the loom: *Jhini jhini bhini chadariya*. The early musical oral traditions of the weaving communities be it the Sengunta-Kaikkolar, the Devangar or the Saliyar, were interspersed with

rituals, proverbs, riddles and other genre of folk tradition peculiar to their community. These community traditions relate not merely to the world view of the weavers but to their use of traditional weaving technologies and design techniques.

These folk traditions reveal the totality of the existence of the weaver-his style of life, beliefs and superstitions, religion and ritual, his views on politics and society.

Today with increasing mechanisation and ultra-modernization, the machine fast threatens to replace man. The jetlooms and the powerlooms are rendering the handloom redundant. At this rate the *charkha* or *kairattu* as we say in Tamil and the traditional *tari* that is the spinning wheel and the handloom which are most representative of our traditional technologies may end up as museum exhibits. Recently when I asked a pit loom weaver in the Gugai area of Salem about his welfare, he lamented: *Tarikkuzhi alla, chavukkuzhi* meaning *It is the grave pit not the loom pit*. At Erode, another ancient textile centre, a

weaver remarked with a touch of irony, *kadar kadarudu*, a pun on the word *kadar*. The word *kadar* means homespun cloth (Gandhi's khadi') but in the Tamil language *kadaral* means lamentation or agony cry. He meant the *kadar* was in its death throes.

This harping back to the folk memories of the weavers is not to reject all that is modern in the weaving industry but merely to question the appropriateness of the jet loom technology to the weaving communities. It is very important to bring to one's mind that the Indian textile industry in south India goes back

two thousand years and as late as 1720 Coromandel textiles enjoyed an international export market. As the European traveller so rightly remarked *Indian cotton was king*. Surely Coromandel textiles and the inimitable designs of the weavers of Kanchipuram, Madurai and Salem possessed an inherent strength. The traditional technologies of the weaving industry could meet the challenge of what the economic historian Tapan Roy Chaudhuri called *export boom*. In this age where computer designs threaten to replace the creativity of the South Indian weaver, it is well worth exploring the strength of the traditional textile technology which had made Indian cotton *king*.

Late-5 The Role of Women in Traditional Sciences & Technologies

Chitra Sahasrabudhay

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Women constitute today the axis of much that survives of the traditional sciences and technologies of India (TSTI). It is in agriculture, household industries, food processing and preservation, non-formal education and healthcare that one finds the presence of both women and TSTI in a big way. Since the organisation of life and public activity has changed so much over the years the traditional methods even in these areas are not noticed as a matter of course. However, if we pay a little attention we will not only find quantity wise a fairly large part of these activities organised in traditional ways but we will also find that women play an extensive and a key role in them.

The situation

A number of studies on agriculture show how mechanisation and modernisation of agriculture displace women from their original work in a big way turning them into menial workers both at home and on the fields. Wherever the traditional organisation of agriculture persists women have their share of work in practically every stage from sowing to grain storage. They have the intricate knowledge and skill required in the performance of their jobs and in addition partake in the management of agricultural affairs.

Food processing and preservation almost entirely belongs to them just as children's education at home and primary health care belongs to them. In all these areas their knowledge and industry is unparalleled.

Working with wood, mud, metals, stones, leather, cotton etc. and vegetable resource in general in the domestic setting as household industries constitutes the scene of traditional industries today. Whatever we see today is what has survived in spite of a 200 years long onslaught. The near total disorganisation of traditional industries has played havoc with the lives of women of this country. So, it seems, women have staked their honour and toil for the preservation of what can become the instrument of the regeneration of their lives one day. It will practically be impossible to find two successive stages in any one of the traditional industries in which involvement of

women is not there. Although one may identify areas like preparation of raw materials and jobs requiring special finesse etc. as specially belonging to women however it is impossible to separate her activity in the above industries even conceptually. This is not because of low level of differentiation and division of labour but due to an entirely different method of organisation of traditional industries, a method of organisation not separable from the communitarian organisation of society.

Return to Life

It can reasonably be said, therefore, that promotion and regeneration of TSTI is inextricably linked with the Indian women coming back to life. It will not only make her an important earning member in the family but enrich her life with initiative, self confidence and decision making ability and status. This will promote her in general into a position of equal partnership in the organisation of domestic, social and national life. The promotion of TSTI may perhaps be the greatest and most effective measure of the contemporary times for the all round betterment of women's conditions.

Proposal for a conference

This is, therefore, to propose a women's conference on this issue in the Second Congress on Traditional Sciences and Technologies of India to be organised by the PPST Foundation and Anna University in Madras at the end of December 1995. The Conference may limit itself to the wide enough issue of traditional industries to be both simultaneously manageable and effective. This conference may be divided into the two complementary parts, one focusing on the role of women in traditional industries and the other how regeneration of traditional industries promises women a return to life. Given below is a brief outline of how we may do it.

1) Role of women in preservation of traditional industries-

- This session may be expected to discuss how women have actually been instrumental in preservation of a great variety of traditional industries, processes, skills and knowledge.

-Further an argument may be placed before the participants how women as women are specifically tuned to work with initiative and ease in the organisation of production and the social organisation attending traditional industries.

2) How regeneration of traditional industries is in the all round interest of women-

-The present focus on revival of traditional industries (policies, market, technology, state and society) to be critically examined from the point of view of restoration of initiative, status and dignity to women.

-An around argument discussing the nature of policy thrust required (finance, market, technology, social organisation) from this point of view to be place before the conference. This may deal with both conceptual an the actual issues involved in the making of a policy for the regeneration of traditional industries and show how this can not but restore to women initiative, status, dignity etc.

3) A panel discussion to focus on the essential issues that emerge in the conference.

Late-6

Metallurgical Aspects in Kautilya Arthasastra

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Kautilya Arthasastra mainly deals with *the science of economics*, including various subjects, that is administration, law, order and justice; starting productive enterprises, taxation, revenue collection, budget and accounts; foreign policy; defence and war. The antiquity of this work can be laid down with

some degree of practical certainty that it ranges between 4th century B.C. to 150 A.D. In the course of dealing with the above said subjects few aphorisms contain matter related to materials of metallurgical importance. This paper tries to investigate and reveal the scientific value of these aphorisms.

Late-7

Basket Weaving in a Southern Western Ghat Village-Bio-Social Perspective

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Recent sustainable forest management practices promote industries based on both timber and Non-Timber Forest Products (NTFPs) providing improved economic and social equity and quality of life. In India, NTFPs play a major role both in terms of revenue and employment generated especially in the rural areas near the forest ecosystems. The non-timber forest products accounted for \$ 134 million, ie, 40% of the total revenue accruing to the government from forestry sector and their share of exports was 63% in the year 1977. Equally important was the employment generated in that year, which was estimated at 70% of the total 2.3 million man-years in the whole forestry sector. The true figure including those man-years not counted by official surveys, can be approximately 4 million. This paper focuses on one of the NTFP industries in the southern Western Ghats.

The culms of reeds, *Dendrocalamus strictus* (Poaceae), are used for basket weaving in three hamlets, Therkumedu, Angankaladi and Bhagavathipuram, in Shencottah Taluk, Tirunelveli district, Tamil Nadu (8 50' & 9 North latitude and 77 10' & 77 20' East longitude). These hamlets lie at the foot hills of southern Western Ghats at a distance of 14kms from the tourist centre, Courtallam. Out of the three hamlets, two viz. Therkumedu and Angankaladi were chosen for intensive study because of the comparatively high dependency of their local inhabitants on this cottage industry. The finished products are exported to various towns in Tamil Nadu (especially

to towns in Salem district as it is the largest producer of betel leaves in the State) are specifically used for package and transportation of betel leaves.

The total weight of reeds used for the year 1993 was calculated and the total level of employment generated was worked out. This industry provides 2,59,200 workdays per year (man-years) with a total of 1,550 people employed directly. The market structure of this industry shows that weavers have no direct links to the market and the finished products are marketed either through agents or sub-agents. If we consider the persons indirectly involved (agents, headload workers and manpower for transportation), the total level of employment generated will be approximately 1,600 people per year.

The historical profile of this industry clearly shows the effect of commercial exploitation of reeds by a paper mill during the period 1984 to 1989. The clear felling of root-stocks, in contrast to the selective felling by local people, have depleted this resource forcing the rural inhabitants to travel more distance for collection of reeds (from 5 to 7 kms. to 15 kms.) within a ten year period (1980-1990). This ultimately affected the output in terms of total number of baskets produced per household, ie, from a total output of 540 baskets per household per month in 1980 to 270 baskets in 1990. At present, the baskets weaved are of three sizes, small, medium and large, which fetches Rs.80.00, Rs 85.00 and Rs.100.00 per bundle respectively. The size of the baskets weaved depends mainly on the

availability of suitable culms for weaving. The decline in the total number of baskets produced per households has been compensated by the fact that the price of baskets had increased during the past years and possibly this would have made the weavers to weave baskets of various sizes for maximum utilisation of the raw material.

Usually the male members are responsible for collection and transportation of culms from the forests to the village. Weaving is mainly done by the women folk of the village, although men also participate in the process. Basket weaving is done in these three hamlets through out the year except during paddy harvest season (10 to 20 days in both the months of January and September of each year) as there is a high demand for agricultural labourers during these times. The peak season of this

industry is during the months of February to May in relation to the high production of betel leaves in various towns of the State of Tamil Nadu. During rainy seasons the output of this industry is reduced considerably because collection and transportation of culms becomes tedious.

This industry provides subsidiary income to more than 70% of the households in these two hamlets. Those households which depend predominantly on this industry derive their subsidiary income from agricultural labour or non-agricultural labour. At present, this industry plays a significant role in the village economy providing employment to the inhabitants. A participatory discussion was conducted with the basket weavers for evolving sustainable management strategies for this resource.

Late-8 Development and Preservation of Science and Technology By Tribes - A Comparative Study

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The traditional science & technologies that have been evolved & refined through ages is being subconsciously eroded by the modernisation of society. So we need to look into our past and analyse and adopt the salient features which can be applied in the modern circumstances. It goes as simple as the fact, *A tree can't stand and survive without its roots*. So our society which is drifting away from its roots needs to develop a link with our past heritage.

In today's scenario, we are moving leaving our past behind but the need of the hour is to carry our past into our future.

Trying to look into the past existing at present but not effected by the present was a difficult job. Trying to find the solution, we struck upon the idea of studying a tribal settlement through which we would be able to study our traditional sciences & technologies in the best possible way.

They have sustained their very own culture, tradition, science & technology, ideologies and principles and concept of life. Their living style has not been polluted by modern day technologies.

Looking for the relevant matter we came across the documentation of two different tribes- (1) Dandami Marias of Telam (Bastar), (2) Bharias of Patalkot done by two group of students of our own department i.e Dept. of Architecture, M.A.C.T., Bhopal for NASA '93, NASA '95. Going through their documentation details we realised that this could help us to proceed with our objective of acquainting ourselves with traditional science & technologies.

So we studied two tribes of different areas:

- (1) Dandami Marias of Telam are the offshoots of Gond who migrated some 500 yrs. ago to southern part of Bastar from central India. The introvert attitude and self con-

finer tendency of Dandami Marias leads to a negligible change in the status where they are still dependent on natural aids, unintruded by the urban revolution.

- (2) The Bharias of Patalkot live in the area below mean sea level not easily accessible. This peculiar feature has helped in curtailing down the modernization. Hence helped them in establishing a segregated entity.

The most important similarity between these two settlements is that - Both are uninfluenced by the modern day developments and have sustained themselves through ages in their own domain amidst their natural settings. The major difference lies in the fact that they belong to two different parts of the country living in different climatological and geographical and ecological setups. The point of curiosity lies in the fact that in spite of the differences both the communities have indigenously developed a self sustainable style of living.

To know more about it we need to do an in-depth study and analysis of their:

Life style

- Origin
- Culture & tradition
- Social set up
- Physiography
- Ideologies
- Building construction techniques
- Materials
- Trade & Commerce
- Settlement pattern
- Factors influencing planning principles
- Religious beliefs
- Their concept of society/community
- Role of community & the zone of influence

On basis of comparative study of these two tribes conclusions can be drawn on:

1. The role of community in developing a self-sustainable settlement
2. How the traditional science & technology can be adopted & promoted in today's context.

We should consider our traditional sciences & technologies as they have been developed indigenously by our ancestors for

our own settings rather than borrowing it from others, which have been developed in totally different cultural, climatological and ecological settings.

This presentation aims at enlightening the august gathering that the future lies simply not in apeing the west with their technologies suited to their ecology, But by promoting our own time-tested techniques, technologies and sciences.

Late-9

Traditional Iron Technology in Ancient Sri Lanka

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According to archaeological evidence, iron production technology was first introduced to Sri Lanka by megalithic migrants to the island in the 9th century BC. In the course of the centuries that followed, iron production technology developed several indigenous features and became widespread throughout the country. Even though, this heritage has since been lost to present day Sri Lankans, traditional features of this technology exist in written evidence and constructional remains.

This paper will deal with ancient iron smelting techniques which are no longer used in contemporary Sri Lanka. However, even though the knowledge of smelting has been lost, in traditional village communities iron forging (smithing) is carried out using scrap metal.

Recent archaeological excavations in the Kiri Oya valley in Sigiriya in the Dry Zone and Ihala Valave valley in the Balangoda region of the Wet Zone yielded considerable evidence of ancient iron smelting process in Sri Lanka. The technology of the bloomery furnaces excavated at these sites is in many ways similar to the ancient iron technology of India.

The furnaces found at Alakolavava in Sigiriya were made by carving out the bedrock into an oval shaped pit. The height of a furnace was approximately 2m, while the width at the bottom of the furnace was 1m and the depth was 50cm. Eight tuyeres have apparently been used per furnace to avoid cold zones and to increase the temperature. It is possible that the iron smelters of Alakolavava used more than one bellow per furnace.

The furnaces at Samanalavava did not reveal any evidence to suggest the use of bellows. However, the monsoon winds that lashed across the region at a velocity of 70 miles per hour from April to August were used as a natural draught instead.

Although these sites are located in two vastly diverse regions, it is apparent that they used a similar technology. However, archaeological evidence reveals that the Alakolavava smelters used iron ore of the magnetite variety, whereas the Samanalavava smelters used limonite.

By the analysis of iron slags it is evident that the Alakolavava smelters possessed a very high technology in order to smelt the maximum quantity of iron from the ore.

The people who smelted iron using the bloomery process belonged to the yamanno caste, whereas those producing iron tools and steel belonged to the navandanna or aachari caste. This caste system was occupationally based and technological know-how was handed down from generation to generation. The caste system in ancient Sri Lanka was developed to maintain the socio-economic systems of the day.

The aachari caste was obligated to contribute a fixed quantity of steel to the Royal Treasury annually. This was their *ra-jakariya* or service to the king. There is ample evidence to suggest that they were allocated land in return for their services to the state. They produced mainly iron implements for local consumption including *mammoties*, knives, axes and sickles for agriculture; swords, spear heads, arrow heads and gun barrels for warfare; surgical instruments such as forceps, scalpels; writing instruments including pen nibs and building equipment and tools such as keys, locks, hinges, latches, nails, chisels etc.

As early as the 3rd century BC, steel implements must have been used to carve the pre-Brahmi cave inscriptions on hard surfaces like granite. With developments over time, steel production in Sri Lanka reached its zenith during the 5th century AD. The transition that occurred from limestone to granite as a building material, was probably a major reason for this development. The extensive distribution of rock sculptures of outstanding artistic quality, are a good example of the quality of traditional steel technology.

As mentioned above, the inception of the island's iron technology in the 9th century BC evidently continued even after the 16th century AD, as indicated by descriptive literary sources.

This technology gradually declined, with the advent of foreign rule. A major reason for this decline was the importation by colonial governments of large quantities of cheap steel and iron implements from Europe and the inability of the indigenous iron producers to adopt new advances in technology.

Analysis of Mind and Mental phenomena is a strong point of Indian theoretical traditions. It is one domain where theoretical quest in the Indian civilization outshines rest of the world. On this subject there is a rich variety of theoretical stances and practices found in the Indian tradition which need to be advanced, examined and celebrated. This aspect can be included under the following topics:

1. Mechanisms of Antahkarana in accordance with various *Darsana-s* and practices *Stuff* (matter) of the Mind; Organs of the Mind and their functioning; Nature and typology of Mental Phenomena; Details of Mental states etc. Nature and function of Indriya-s; Nature and Function of Manasa; Theory of Sanskara and Karma; Functioning of Smriti; Mechanisms of Controlling Manasa and Samadhi.

2. Phenomena of Antahkarana in various Shastra-s. In yoga Sastra; In Vyakarana Sastra; In Tantra traditions; In Indian Medical Tradition; In Sangita Sastra; In Alankara Sastra etc.

3. Modern studies of Cognitive Science inspired by Indian tradition

Syntax of the Mental activity; Representation of Mental activity; Representation of Perception inference, analogy etc.

4. Modern philosophical Studies on Mind in the Indian Tradition

Nature of Mental Effort; Nature of Mental event; Structure of Mental Acts; Causation in Mental Phenomena; Mind Body Relation

A. Somasundaram

Everest Engineering Works, Coimbatore

The Viswakarma community to which I belong, has been the engineering class of India. Even banking had its origin in our community, when people deposited gold and silver with us to make into ornaments and for safe custody; the receipts issued to them evolved into what are now known as *cheques*. Starting with Iron fillings mixed with sand on the shores of rivers, our forefathers eventually discovered that iron can also be made from mineral ores. Wrought iron, cast iron, carbon steel and a number of other alloys were manufactured. Knives, swords and other weapons of war made by them were famous for their sharpness and durability. Kings and rulers honoured practitioners of our profession and gave them several special privileges.

My family was a family of village blacksmiths. We use to make ploughs and other farm implements, bullock-carts, irrigation equipments, nails, hinges, and bolts for houses and even the writing pen for scholars. I was initiated into the profession at the age of eleven. My formal education was stopped so that I may become proficient at work. That was the tedious soon after the end of the First World War. I am glad, because otherwise I would today be a retired Superintendent Engineer - not one who has established Everest Engineering Works at Coimbatore, nor would I have been able to employ about a thousand workers. Though I still regret the lack of formal education, and convinced that it is only due to its lack that I have acquired a rich fund of experience that has enabled me to which what I have.

During those post-war days, it became necessary to produce textile machinery indigenously, and the Textool Ltd. was set up. I joined this firm and began my career. Soon I began to

fabricate metal doors, windows and other small objects. Then, broadening my range of products, I started by the name *Everest Engineering Works*. In the course of 40 years, this company had manufactured large pressure vessels, heat exchanges, digesters, precision equipments and other spare parts for power stations, petroleum and fertiliser factories and other industries. In executing these contracts I have always been fastidious about quality control and adherence to time schedules. The work was very challenging since, being contract jobs, every order was new and different, requiring total involvement of my part. I have even successfully undertaken to make instruments for ships and heat shields for the rockets designed at the Vikram Sarabhai Space Centre in Trivandrum. To the extent possible, I avoid saying that something cannot be done. This is because working with iron is my family profession. If I cannot do it, then who else can?

Traditional knowledge of my family has equipped me to lead a successful life and face up to modern technical challenges. However, today caste has become a bad word which cannot be mentioned in polite company. At the same time, we find that even the so called lower castes are proud of belonging to their communities. It is argued that caste has prevented unity among people, and enslaved us to foreign rule.

But what is caste? Depending upon their occupations, the members of a society are divided along various professional groupings. Each of us respects our profession, so why should we not be proud of belonging to our caste which has been formed on the basis of our profession? I don't find any reason to say that we should not be proud of it.

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About the Madras Congress

The Congress at Madras during December '95 follows the one held at Bombay two years earlier. The Bombay Congress attempted to put across the position that Traditional Sciences, Technologies, Knowledge, practice and organisation constitute an enormous resource-base for much of our developmental and nation-building efforts. It was essentially an effort to evolve an integrated perspective on this theme, and generate large-scale dialogue and debate on its potential scope and problems in the contemporary context.

The Congress at Madras is aimed at consolidating and carrying forward this process. While continuing to create greater public awareness on the potential and scope of our Traditional Sciences and Technologies, the Madras Congress has particular focus on evolving ways through which these potentials can be actualised. Consequently, issues relating to policies, plans, organisation and methodologies find central place in the Madras Congress. Also of central importance is the involvement and participation of organisations of Traditional Artisanal and professional communities in the work of the Madras Congress.

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